Product Service Manual – P244W

Service Manual for acer:
P244W-1A2H

P/N: 9J.0LN16. xxx

Applicable for All Regions

Version: 001
Date:2008/07/14

Notice:
- For RO to input specific "Legal Requirement" in specific NS regarding to responsibility and liability statements.

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Abbreviations & Acronyms

1. About This Manual

This manual contains information about maintenance and service of acer products. Use this manual to perform diagnostics tests, troubleshoot problems, and align the acer product.

1.1. Trademark

The following terms are trademarks of Acer Inc. :
Acer

Importance

Only trained service personnel who are familiar with this Acer Product shall perform service or maintenance to it. Before performing any maintenance or service, the engineer MUST read the "Safety Note".

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2. Introduction

This section contains general service information, please read through carefully. It should be stored for easy access place for quick reference.

2.1. RoHS (2002/95/EC) Requirements

– Applied to all countries require RoHS.

The RoHS (Restriction of Hazardous Substance in Electrical and Electronic Equipment Directive) is a legal requirement by EU (European Union) for the global electronics industry which sold in EU and some counties also require this requirement. Any electrical and electronics products launched in the market after June 2006 should meet this RoHS requirements. Products launched in the market before June 2006 are not required to compliant with RoHS parts. If the original parts are not RoHS complaints, the replacement parts can be non ROHS complaints, but if the original parts are RoHS compliant, the replacement parts MUST be RoHS complaints.
If the product service or maintenance require replacing any parts, please confirming the RoHS requirement before replace them.

2.2. Safety Notice

1. Make sure your working environment is dry and clean, and meets all government safety requirements.
2. Ensure that other persons are safe while you are servicing the product.
   DO NOT perform any action that may cause a hazard to the customer or make the product unsafe.
3. Use proper safety devices to ensure your personal safety.
4. Always use approved tools and test equipment for servicing.
5. Never assume the product's power is disconnected from the mains power supply. Check that it is disconnected before opening the product's cabinet.
6. Modules containing electrical components are sensitive to electrostatic discharge (ESD). Follow ESD safety procedures while handling these parts.
7. Some products contain more than one battery. Do not disassemble any battery, or expose it to high temperatures such as throwing into fire, or it may explode.
8. Refer to government requirements for battery recycling or disposal.

2.3 .Compliance Statement

Caution: This Optical Storage Product contains a Laser device. Refer to the product specifications and your local Laser Safety Compliance Requirements.

2.4. General Descriptions

This Service Manual contains general information. There are 3 levels of service:
Level 1: Cosmetic / Appearance / Alignment Service
Level 2: Circuit Board or Standard Parts Replacement
Level 3: Component Repair to Circuit Boards

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3. Product Overview

3.1. Introduction

1 1. Introduction

P244W is defined as our new 24'W model in ACER P series which will be the ACER project in Qisda. P244W is defined as 24'W LCD Monitor supports 1920(H) x 1080(V) resolution with DPMS (Display Power Management System) and ACER eColor function. There are triple input types, D-sub, HDMI x 2. P244W adopts AUO panel, M240HW01V0. P244W has external docking that is consigned by Acer and designed by DXP. External docking is included 3W+3W Dolby speaker, USB hub.

The features summary is shown as below,

*** All panel spec. in C201 definition depends on the variance of panel source.**
*** All spec. of monitor need to warm up at least 1hr.**
*** To test the "Contrast Ratio" and "Luminance" functions, the color status must be "User preset" mode.**
*** 1. "Contrast Ratio": Set "brightness" at 100, and "contrast" at 50.**
*** 2. "Luminance": Set "brightness" at 100, and "contrast" at 100.**

Feature items	Specifications	Remark
Panel supplier & module name	AUO M240HW01V0	TN, Normally white
Screen diagonal	24W"	531.6 (H) x298.89(V)
Display Format	1920(H) x 1080 (V)	Panel Display information
Pixel Pitch	276.75 um x 276.75um	per one triad
Viewing Angle (@ Contrast Ratio >= 10)	R/L:85/85 degrees (typ) U/D: 80/80 degrees (typ)	
Analog interface with Scaling supported	Yes	With 15-pin D-sub connector
HDMI interface with Scaling supported	Yes	For 1A2H model
Max resolution mode supported	1980 (H) x 1080 (V)@60Hz	
Number of Display Colors supported	16.7 Millions	RGB 6-bit +Hi-FRC
Contrast Ratio	1000:1 (typ.),600:1(min)	Test Condition: Set Contrast at 50, Brightness at 100, Color at User preset
Luminance	300 cd/m^2 (typ.),240 cd/m^2 (min)	Test Condition: Set Contrast at 50, Brightness at 100, Color at User preset
AC power input	Yes	90-264 Volts, 47-63 Hz.
DC power input (with AC power adapter)	No	
DPMS supported	Yes	≤1W
LED indicator for power status showed	Yes	White/Amber
OSD for control & information supported	Yes	
Multi-language supported for OSD	Yes	EMEA Non-EMEA
Buttons control supported	Yes	6 buttons including 1 monitor power on/off control button.

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Flywheel control supported	No	
Scaling function supported	Yes	
Auto adjustment function supported	Yes	"Auto-Key" function
DDC function supported (EDID ver. 1.3)	Yes	DDC2B
DDC-CI support version 1.1 or later	Yes	DDC-CI
Audio speakers supported	No	
Audio Jack (input connector) supported	No	
Earphone Jack (Output connector) supported	Yes	For HDMI Audio Output
Microphone function supported	No	
Mechanical Tilt base design	Yes	From -5 to +23 degree
VESA wall mounting design	Yes	
Mechanical Rotate design	No	
Mechanical Lift base design	No	
Kensington compatible lock design	Yes	

3.2. Operational Specification

3.2.1 Power supply

Item	Condition	Spec	OK	N.A	Remark
Input Voltage range	Universal input full range	90~264VAC /47~63Hz	√		
Input Current range	90 ~ 264VAC	≤ 2.0 Arms	√		
Power Consumption	Normal "On" operation	**< 75 W**	√		LED: Blue
DPMS	DPMS "Sleep" state	≤ 2 W	√		LED: Amber
DPMS	DPMS "Off" state	≤ 1 W	√		LED: OFF
Inrush Current	110 VAC 220 VAC	**< 30 A (peak)** **< 60 A (peak)**	√		Cold-start
Earth Leakage Current	264 VAC/50Hz	< 3.5 mA	√		
Hi-Pot	1. 1500VAC, 1 sec 2. Ground test: 30A, 1sec	Without damage < 0.1 ohm	√		(on-line test) (in-lab test)
Power Line Transient	IEC1000-4-4	1KV	√		
	IEC1000-4-5 (Surge)	Common: 2KV, Differential: 1KV	√		
CCFL operation range	90 ~ 264VAC	3~8mA	√		Depends on panel source
CCFL Frequency	90 ~ 264VAC	40KHz ~ 80KHz	√		Depends on panel source
Power cord		Color: Black Length: 1800 +/- 50 mm	√		

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3.2.2 Signal interface

Item	Condition	Spec	OK	N.A	Remark
Signal Cable	15-pin D-Sub	Color: Black Length: 1800 +/- 30 mm	√		
	24-pin DVI-D	Color: Black Length: 1800 +/- 50 mm	√		
Pin assignment	15-pin D-sub connector	See Note-1	√		For 15-pin D-sub
	24-pin DVI-D connector	See Note-2	√		For 24-pin DVI-D
	19-pin HDMI connector	See Note-3		√	For 19-pin HDMI
Analog input	Signal type	Separate analog R/G/B	√		For 15-pin D-sub
	Level	700 mV (peak to peak)	√		
	Impedance	75 Ohms +/- 1.5 Ohms	√		
Sync input	Signal type	Separate H/V-sync Composite H/V-sync (Positive/Negative)	√		For 15-pin D-sub
	Level	Logic High: 2.4V ~ 5.5V Logic Low: 0V ~ 0.5V (TTL level)	√		Refer to VESA VSIS Standard V1R1
	Impedance	Minimum 2.2KΩ(pull down)	√		10KΩ for application
	Sync Pulse Width (SPW)	0.7μs < H-SPW 1H < V-SPW	√		
Digital input	Level	600mV for each differential line	√		
	Impedance	50 Ohm TDR Scan needed for DVI cable and interface board	√		
	Impedance	50 Ohm TDR Scan needed for DVI cable and interface board	√		

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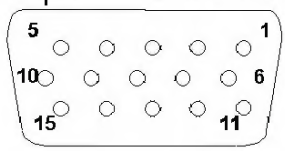
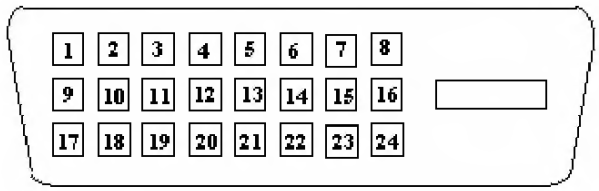
Note-1: The pin assignment of 15-pin D-sub connector is as below,



Pin	Signal Assignment	Pin	Signal Assignment
1	Red video	9	PC5V (+5 volt power)
2	Green video	10	Sync Ground
3	Blue video	11	Ground
4	Ground	12	SDA
5	Cable Detected	13	H-Sync (or H+V)
6	Red Ground	14	V-sync
7	Green Ground	15	SCL
8	Blue Ground		

Note-2: The pin assignment of 24-pin DVI-D connector is as below,



Pin	Signal Assignment	Pin	Signal Assignment
1	TMDS RX2-	13	Floating
2	TMDS RX2+	14	+5V Power
3	TMDS Ground	15	Ground
4	Floating	16	Hot Plug Detect
5	Floating	17	TMDS RX0-
6	DDC Clock	18	TMDS RX0+
7	DDC Data	19	TMDS Ground
8	Floating	20	Floating
9	TMDS RX1-	21	Floating
10	TMDS RX1+	22	TMDS Ground
11	TMDS Ground	23	TMDS Clock+
12	Floating	24	TMDS Clock-

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Note-3: The pin assignment of 19-pin HDMI connector is as below,

Table 4-8 Type A-to-Type A Cable Wire Assignment

Type A pin	*Signal Name*	*Wire*	*Type A pin*
1	*TMDS Data2+*	*A*	*1*
2	*TMDS Data2 Shield*	*B*	*2*
3	*TMDS Data2–*	*A*	*3*
4	*TMDS Data1+*	*A*	*4*
5	*TMDS Data1 Shield*	*B*	*5*
6	*TMDS Data1–*	*A*	*6*
7	*TMDS Data0+*	*A*	*7*
8	*TMDS Data0 Shield*	*B*	*8*
9	*TMDS Data0–*	*A*	*9*
10	*TMDS Clock+*	*A*	*10*
11	*TMDS Clock Shield*	*B*	*11*
12	*TMDS Clock–*	*A*	*12*
13	*CEC*	*C*	*13*
14	*Reserved (in cable but N.C. on device)*	*C*	*14*
15	*SCL*	*C*	*15*
16	*SDA*	*C*	*16*
17	*DDC/CEC Ground*	*D*	*17*
18	*+5V Power*	*5V*	*18*
19	*Hot Plug Detect*	*C*	*19*

3.2.3 Video performance

Item	Condition	Spec	OK	N.A	Remark
Max. support Pixel rate		173 MHz	√		Both for analog and digital inputs
Max. Resolution		1920 x 1080	√		Both for analog and digital inputs
Rise time + Fall time		< 5 ms (50% of minimum pixel clock period)	√		1920x1080 @ 60Hz (max. support timing)
Settling Time after overshoot /undershoot		< 5% final full-scale value	√		Refer to VESA VSIS Standard V1R1
Overshoot/Undershoot		< 12% of step function voltage level over the full voltage range	√		Refer to VESA VSIS Standard V1R1

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3.2.4 Scan range

Item	Condition	Spec	OK	N.A	Remark
Horizontal		31-83 KHz	√		
Vertical		56-76 Hz	√		

3.2.5 Plug & Play DDC2B DDC-CI Support

Item	Condition	Spec	OK	N.A	Remark
DDC channel type		DDC2B	√		
EDID		Version 1.3	√		Refer to S/W spec. document to see the detailed EDID data definition.
DDC-CI		Version 1.1 or Later	√		Refer to S/W spec

3.2.6 Support Timings

Mode	Resolution (active dot)	Resolution (total dot)	Horizontal Frequency (KHz)	Vertical Frequency (Hz)	Nominal Pixel Clock (MHz)
	640x480@60Hz	800 x 525	31.469	59.941	25.175
	640x480@72Hz	832 x 520	37.861	72.809	31.500
	640x480@75Hz	840 x 500	37.500	75.000	31.500
MAC	640x480@66.66Hz	864x525	35	66.66	30.24
VESA	720x400@70Hz	900x449	31.469	70.087	28.322
SVGA	800x600@56Hz	1024 x 625	35.156	56.250	36.000
	800x600@60Hz	1056 x 628	37.879	60.317	40.000
	800x600@72Hz	1040 x 666	48.077	72.188	50.000
	800x600@75Hz	1056x625	46.875	75.000	49.500
MAC	832x624@74.55Hz	1152x667	49.722	74.55	57.28
XGA	1024x768@60Hz	1344x806	48.363	60.004	65.000
	1024x768@70Hz	1328x806	56.476	70.069	75.000
	1024x768@75Hz	1312x800	60.023	75.029	78.750
MAC	1152x870@75Hz	1568x909	68.700	75.000	84.520
VESA	1152x864@75Hz	1600x900	67.5	75	108
	1280x960@60Hz	1800x1000	60	60	108
SXGA	1280x1024@60Hz	1688x1066	63.981	60.020	108.000
	1280x1024@75Hz	1688x1066	79.976	75.025	135.000
VESA	1280x720@60Hz	1650x750	44.955	59.940	74.176
	1280x768@60Hz	1664x798	47.776	59.870	79.500
	1280x768@60Hz	1696x805	60.289	74.893	102.250
WXGA	1280x800@60Hz	1680x831	49.702	59.810	83.500
	1360x768@60Hz	1792x795	47.712	60.015	85.500
WXGA+	1440x900@60Hz	1904x931	55.935	59.887	106.500
	1440x900@75Hz	1936x942	70.635	75.000	136.750
UXGA	1600X1200@60Hz	2160x1250	75.000	60.000	162.000
WSXGA+	1680x1050@60Hz	2240*1089	65.290	59.954	146.250
	1680x1050@75Hz	2272*1099	82.306	74.892	187
UXGA	1600x1200@60Hz	2160x1250	75.000	60.000	162.000
	1920x1080@60Hz	2576x1120	67.158	59.963	173.000

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3.3. Operational & Functional Specification

3.3.1 Video performance

***All spec. of monitor need to warm up at least 1hr.**

Item	Condition	Spec	OK	N. A	Remark
Resolution	Any input resolution modes which are under 1680x1050	1920x1080	√		
Contrast ratio		600(min),1000(typ)	√		Test Condition: Set Contrast at 50, Brightness at 100, Color at User preset.
Brightness	At R/G/B saturated condition	300 cd/m^2 (typ.),240 cd/m^2 (min)	√		Test Condition: Set Contrast at 50, Brightness at 100, Color at User preset.
Response time	Rising + Falling time	On/off:5 ms (typ.),10ms(max)	√		Test Equipment: Westar TRD 100 or equal level equipment ;
Viewing angle	At Contrast ratio = 10	R/L: 85/85 degrees (typ.) 80/80 degrees (min)	√		
	At Contrast ratio = 10	U/D: 80/80 degrees (typ.) 75/75 degrees(min)	√		
CIE coordinate of White		(0.31, 0.33) +/- (0.03, 0.03)	√		
Display colors		16.7 Millions colors	√		6 bit+Hi-FRC

3.3.2 Brightness Adjustable Range

Item	Condition	Spec	OK	N. A	Remark
Brightness adjustable range	At default contrast level (saturate point) & Full-white color pattern	(Max. brightness value – Min. brightness value) ≧ 100 cd/m^2	√		

3.3.3 Acoustical Noise

Item	Condition	Spec	OK	N. A	Remark
Acoustical Noise	At 1 cm distance	≦ 28 dB/A	√		Refer to C326

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3.3.4 Environment

Item	Condition	Spec	OK	N. A	Remark
Temperature	Operating	0 ~ +40 ℃	√		
	Non-operating	-20 ~ +60 ℃	√		
Humidity	Operating	10 ~ 90%	√		Non-condensing
	Non-operating	10 ~ 90%	√		Non-condensing
Altitude	Operating	0~3048m (10,000ft)	√		Without packing
	Non-operating	0~12,192m (40,000ft)	√		With packing

3.3.5 Transportation

Item	Condition	Spec	OK	N. A	Remark
(1) Vibration	Package, Non-Operating	Test Specification: 1. Frequency Hertz 5 ~ 250 HZ , PSD Level 0.0054 (G2/Hz) 2. Grms = 1.146 3. Sweep Time : 30 minutes per Axis 4. Axes : X,Y,Z	√		
(2) Unpackaged Vibration	Unpackaged, Non-Operating	Test Spectrum: 20 Hz 0.0185(g2/Hz) 200Hz 0.0185(g2/Hz) Duration : 5 Minutes Axis : 3 axis (Horizontal and Vertical axis ,Z axis)			
(3) Drop	Package, Non-Operating	76 cm Height (MP stage) (1 corner, 3 edges, 6 faces)	√		
(4) Shock	Wooden package, Non-Operating	1. Amplitude : Half sine-wave 50G 2. Duration : 10 ms 3. Test Times : 1 4.Test Sides : All 6 Sides	√		

3.3.6 Electrostatic Discharge Requirements

Item	Condition	Spec	OK	N. A	Remark
Electrostatic Discharge	IEC801-2 standard	Contact: 8KV Air: 15KV	√		

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3.3.7 EMC

Item	Condition	Spec	OK	N. A	Remark
TCO03	Electric	Band 1 < 10 V/m Band 2 < 1 V/m	√		
	Magnetic	Band 1 < 200nT Band 2 < 25nT	√		
EMI	FCC part 15J class B	After Mass production under 1dBuv for constant measure. Besides DNSF and VCCI class-2 are optional.	√		
	EN55022 class B				

3.3.8 Reliability

Item	Condition	Spec	OK	N. A	Remark
MTBF Prediction	Refer to MIL-217F	> 60,000 Hours	√		Excluding CCFL
CCFL Life time	At 25±2℃, under 7.0mA	40,000 Hours (min)	√		See Note-4

Note-4: CCFL lifetime is determined as the time at which brightness of lamp is 50%. The typical lifetime of CCFL is on the condition at 7.0mA lamp current.

3.3.9 Audio performance

Item	Condition	Spec	OK	N. A	Remark
Preamp + Power amp					
(1)Output power		1 Wrms/CH @ 1KHz		√	
(2)THD (@ 1W)		<1%		√	
(3)S/N ratio		>40dB		√	
Speaker Driver					
(1)Nominal impedance		4 ohm		√	
(2)Rated input power		1 W/CH		√	
(3)Frequency response		180~20KHz SPL-10dB		√	
(4)Output sound pressure level		84 ± 3 dB (1W 0.5M)		√	
(5)Dimension of box		284x60x27mm^2		√	
Audio Control					
(1)Volume range		0 ~100 levels		√	
(2)Mute		On/Off		√	

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3.4. LCD Characteristics

3.4.1 The Physical definition & Technology summary of LCD panel

AUO M240UP01V.0

Item	Condition	Spec	OK	N. A	Remark
LCD Panel Supplier		AUO	√		
Panel type of Supplier		M240HW01V.0	√		
Screen Diagonal		609.7 mm (24.0")	√		
Display area	Unit=mm	531.36(H) x 298.89(V)	√		
Physical Size	Unit=mm	556.0(H) x323.2(V) x 16.65(D)	√		
Weight	Unit=gram	2860 (typ.)	√		
Technology		TN type	√		
Pixel pitch	Unit=um	276.75(H) x276.75(W)	√		Per one triad
Pixel arrangement		R/G/B vertical stripe	√		
Display mode		Normally White	√		
Support color		16.7Millions colors	√		6 bit + HiFRC

3.4.2 Optical characteristics of LCD panel

AUO M240HW01V.0

Item	Unit	Conditions	Min.	Typ.	Max.	Remark
Viewing Angle	[degree] [degree] [degree] [degree] [degree]	Horizontal (Right) CR = 10 (Left) Vertical (Up) CR = 10 (Down)	80 80 75 75	85 85 80 80	- - - -	
Contrast ratio		Normal Direction	600	1000		
Response Time	[msec] [msec] [msec]	Rising Time Falling Time Rising + Falling	- - -	3.4 1.6 5	7.4 2.6 10	
Color / Chromaticity Coordinates (CIE)		Red x Red y Green x Green y Blue x Blue y	0.619 0.308 0.259 0.5793 0.116 0.040	0.649 0.338 0.289 0.609 0.146 0.070	0.679 0.368 0.319 0.639 0.176 0.100	
Color Coordinates (CIE) White		White x White y	0.283 0.299	0.313 0.329	0.343 0.359	
Luminance Uniformity	[%]	9 points measurement	75	80		
White Luminance @ CCFL 7.0mA (center)	[cd/m^2]		240	300	-	
Crosstalk (in 75Hz)	[%]				1.5	

* The test methods for the above items' definition, please refer to the relative panel specification.

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3.5. User Controls

3.5.1 User's hardware control definition

Item	Condition	Spec	OK	N.A	Remark
Power button			√		
Auto button(Exit button)			√		
Right/Inc. button			√		
Left/Dec. button			√		
Menu button			√		
Mode button				√	
Input Select button				√	
E-Key button			√		
Mute button				√	

3.5.2 OSD control function definition

Item	Condition	Spec	OK	N.A	Remark
Auto Adjust		Auto-Geometry	√		
Brightness			√		
Contrast			√		
Horizontal Position			√		
Vertical Position			√		
Pixel Clock			√		
Phase			√		
Color		Cool(9300K) Warm(6500K) User: Separate R/G/B adjustment	√		
OSD Position		OSD Horizontal position OSD Vertical position	√		
OSD Time		From 5 sec to 120 sec	√		
OSD Lock				√	
Language		EMEA/Non-EMEA languages for Asia/Europe Version	√		
Recall		Recall All	√		
Mode		ACER Empower Mode	√		
Input Select		D-sub HDMI * 2	√		
Sharpness				√	
Display Information		For input timing	√		
Volume				√	
Mute				√	
Hot key for Auto			√		
Hot key for Contrast				√	
Hot key for Volume				√	
Hot key for Input Select				√	
Hot key for Mode				√	

The detailed firmware functions' specification, please refer to C212 S/W spec. document.

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3.6. Mechanical Characteristics

3.6.1 Dimension

Item	Condition	Spec	OK	N.A	Remark
Bezel opening		**533.36*300.89 mm**	√		
Monitor without Stand	W x H x D mm	**568.5*357.4*62mm**	√		
Monitor with Stand	W x H x D mm	**568.5*417.9*207.2 mm**	√		
Carton Box (outside)	L x W x H mm	**640*150*493mm**	√		
Tilt and Swivel range		**Tilt: -5 ~ +15 degree** **Swivel: 0 degree**	√		

3.6.2 Weight

Item	Condition	Spec	OK	N.A	Remark
Monitor (Net)		**5.66Kg**	√		
Monitor with packing (Gross)		**7.3Kg**	√		

3.6.3 Plastic

Item	Condition	Spec	OK	N.A	Remark
Flammability		**>ABS<,94-HB**	√		
Heat deflection To	**ABS**	65 ℃	√		
UV stability	**ABS**	**Delta E < 8.0**	√		
Resin		1.BEZEL/BASE:PMMA+ ABS 2.UC/CLMN-F/CLM-R : ABS	√		
Texture		**Uc:AT-IM-D02;** **Bezel: Polish #10000**	√		
Color		**BEZEL : DT02A;** **UC: DB27A**	√		

3.6.4 Carton

Item	Condition	Spec	OK	N.A	Remark
Color		**Kraft**	√		
Material		**A Flute**	√		
Compression strength		**200KGF**	√		
Burst Strength		**16 KGF/cm^2**	√		
Stacked quantity		4 Layers Vertical	√		

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3.7. Pallet & Shipment

3.7.1 Container Specification

Stowing Type	ontainer	Quantity of products (sets) (Every container)	Quantity of Products (sets) (Every Pallet)	Quantity of pallet (sets) (Every Container)
With pallet	20'	**480**	**Pallet A: 48**	**Pallet A: 10**
			Pallet B:	**Pallet B:**
	40'	**1056**	**Pallet A: 48**	**Pallet A: 22**
			Pallet B:	**Pallet B:**
Without pallet	20'		**X**	**X**
			X	**X**
	40'		**X**	**X**
			X	**X**

3.7.2 Carton Specification

3.7.2.1 Product:

Net Weight (Kg)	Gross Weight (Kg)	Dimension w/o Base W*H*D (mm)	Dimension w/ Base W*H*D (mm)
5.66Kg	**7.3Kg**	**568.5*357.4*62mm**	**568.5*417.9*207.2 mm**

3.7.2.2Package:

Carton Interior Dimension (mm) L*W*H	Carton External Dimension (mm) L*W*H
630*140*468mm	**640*150*493mm**

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3.8. Certification

Item	Condition	Spec	OK	N.A	Remark
Environment	Green design	API Doc. 715-C49	√		ISO14000 Requirement
	Blue Angel	German Standard		√	
	E-2000	Switzerland		√	
	EPA	USA Standard	√		
	TCO'99			√	
	TCO'03		√		
	MPR2		√		
	Green Mark		√		
PC-Monitor	Microsoft Windows	PC98/99	√		
	DPMS	VESA	√		
	DDC 2B	Version 1.3	√		
	USB	External		√	
Safety	UL (USA)	UL60950 3rd edition		√	
	CSA (Canada)	CAN/CSA-C22.2 No. 60950	√		
	Nordic / D.N.S.F	EN60950		√	
	FIMKO	EN60950		√	
	CE Mark	73/23/EEC	√		
	CB	IEC60950	√		
	CB	EN60950	√		
	TUV/GS	EN60950 / EK1-ITB 2000:2003		√	
	CCC (China)	CB4943	√		
	GOST	EN60950	√		
	TUV type-approved		√		
	SASO	IEC60950		√	
EMC	CE Mark	89/336/EEC	√		
	FCC (USA)	FCC Part 15 B	√		
	EN55022	Class B		√	
	CISPR 22	Class B		√	
	VCCI (Japan)	VCCI Class B	√		
	BSMI (Taiwan)	CNS 13438	√		
	C-Tick (Australia)	AS/ NZS CISPR22	√		
X- Ray Requirement	DHHS (21 CFR)	USA X- Ray Standard		√	
	DNHW			√	
	PTB	German X- Ray standard		√	
Ergonomics	TUV / Ergo			√	
	ISO 13406-2		√		
	prEN50279			√	

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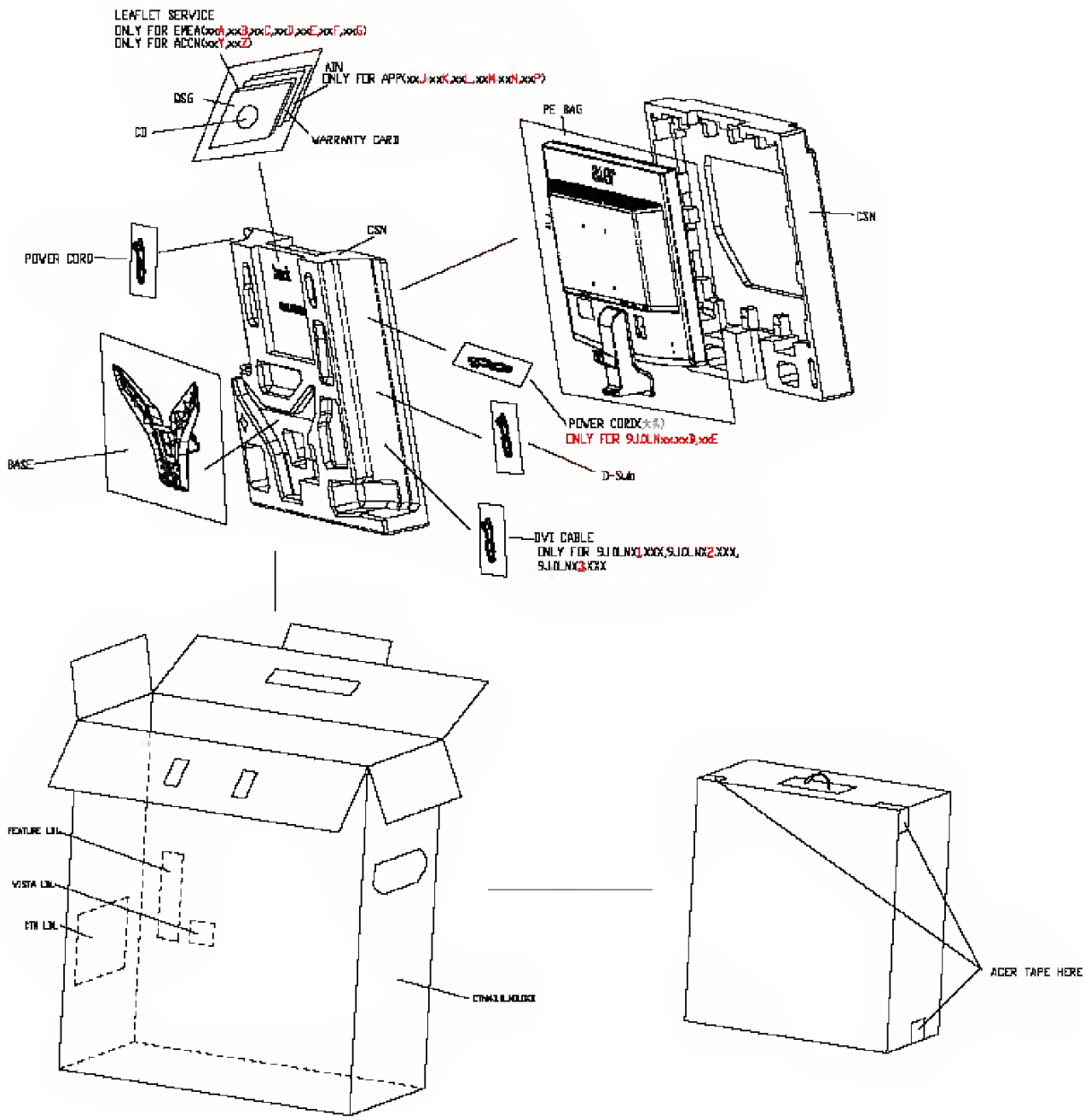
3.9. Packing



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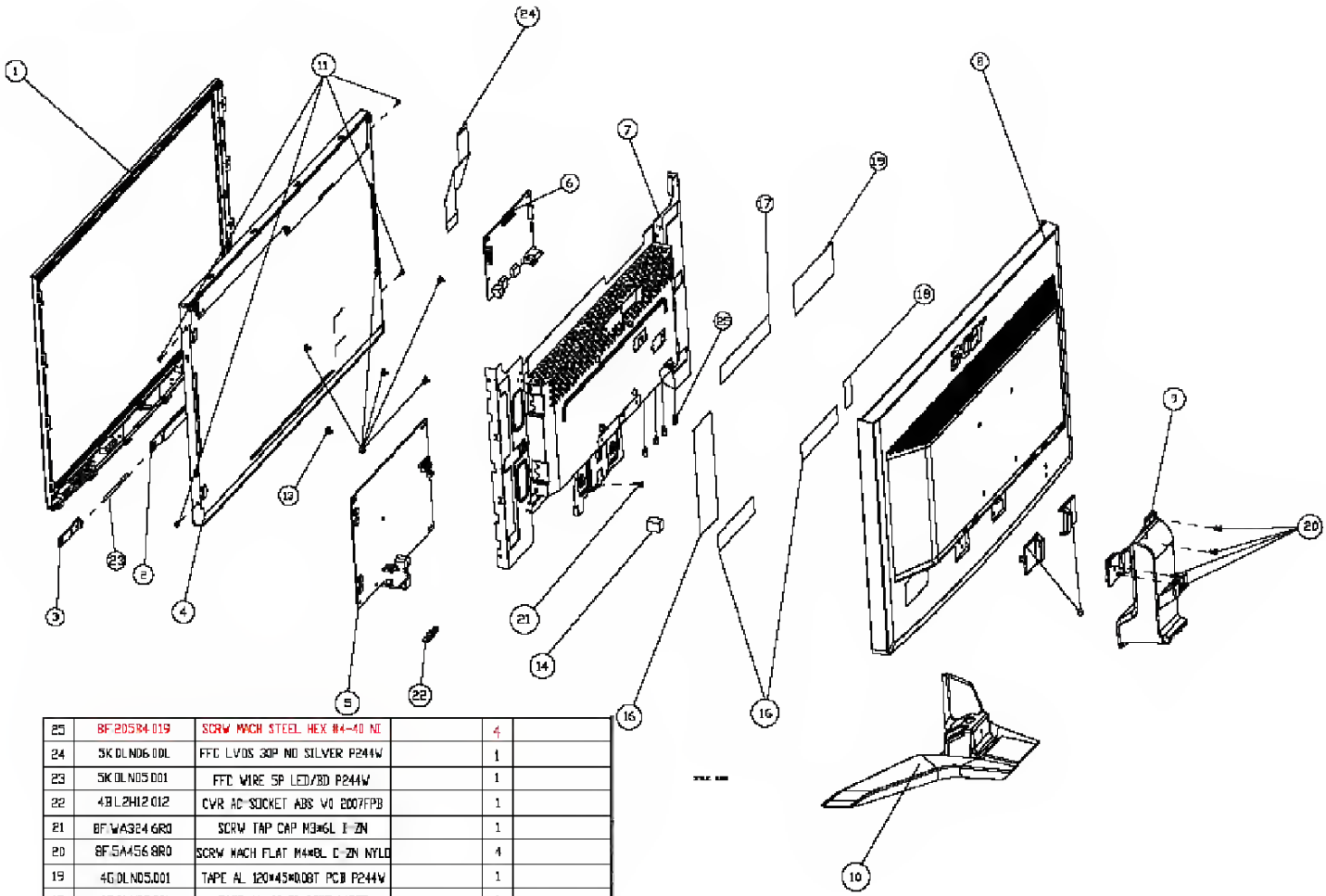
4. Disassembly /Assembly

4.1. Exploded View



ITEM	PART NO	DESCRIPTION	TYPE	QTY	VENDOR
25	8F205R4019	SCRW MACH STEEL HEX #4-40 NI		4	
24	5K0LN06.001	FFC LVDS 30P NO SILVER P244W		1	
23	5K0LN05.001	FFC WIRE 5P LED/BD P244W		1	
22	4BL2H12.012	CVR AC SOCKET ABS V0 2007FPB		1	
21	8F1WA3246R0	SCRW TAP CAP M3*6L I-ZN		1	
20	8F5A4568R0	SCRW MACH FLAT M4*8L C-ZN NYLO		4	
19	4G0LN05.001	TAPE AL 120*45*0.08T PCB P244W		1	
18	4G0LN02.001	TAPE AL 40*20*0.08T L1755		1	
17	4G0E308.001	TAPE AL 15D*25*0.08T VW195		1	
16	4G0F913.001	TAPE AL 10D*25*0.08T TCO V2410W		2	
15	4B0LN07.011	CVR HINGE ABS D327A P244W		2	
14	4G0LN04.001	GASKET 13Lx13Wx0.7H P244W		1	
13	8F1VZ5246R0	SCRW TAP FLAT+EXT M3*6L C-ZN		1	
12	8F00273.6R0	SCRW TAP PH F/10WSH M3*6L C-ZN		6	
11	8F5A2246R0	SCRW MACH FLAT M3*0.5P*6L ZN		4	
10	6E0LN03.001	ASSY BASE WP ABS+P D702A P244W		1	
9	6E0LN02.001	ASSY CLMN ABS DS14C P244W		1	
8	6K0LN06.001	ASSY RC ABS D327A 1AD AU P244W		1	
7	6K0LN07.001	ASSY SHD SECC0.6T AU-1A1D P244W		1	
6	5E0LN01.001	PCBA IF BD MI P244W DUAL		1	
5	5E0LN02.001	PCBA SPS BD MI P244W DUAL		1	
4	5F1U1DV0.011	LCDN24W M240HW01-V0 AU0 Z		1	
3	6K0LN15.001	ASSY LED PCB PB44W		1	
2	6K0LN12.001	ASSY CTRL BD+MYLAR+LIGHT P244W		1	
1	6K0LN05.001	ASSY BEZEL ABS+P P244W		1	

MODEL	P244W	NAME	ASSY-ACER-P244W			
DRN	Alan Chao	24-May-08	MATERIAL			
DSN	Alan Chao	24-May-08	FINISH			
CKD	Sale Lin	24-May-08	SCALE	1.000	DIM IN	mm
APPD	Aaron Ho	24-May-08	SHEET	1OF1	CAVITIES	

Qisda Corporation

TOLERANCE UNLESS OTHERWISE SPECIFIED (±)							
CLASS	A	B	C	D	E	F	G
< 6mm	.008	.05	.01	.02	.05	.1	.2
6 ~ 30mm	.012	.05	.025	.03	.05	.1	.2
30 ~ 120mm	.02	.05	.075	.04	.05	.1	.3
120 ~ 250mm	.025	.05	.1	.05	.1	.2	.5
250 ~ 1000mm	.03	.05	.15	.1	.2	.3	.8
> 1000mm	.1	.1	.15	.2	.3	.4	.8
ANGLE	±1°						

FILE NAME

PART NO 9J0LN1311A

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4.2. Disassembly /Assembly

Assembly Procedure

*** Assembly Tool:** 1. Cross-head Screwdriver (Size: #2)
2. Flat-head Screwdriver (Size: #1)
3. Flat-head Screwdriver (Size: #2)

Step 1: connect power board and interface board and insert LVDS

Step 2: place power board and interface board into the main-shielding.

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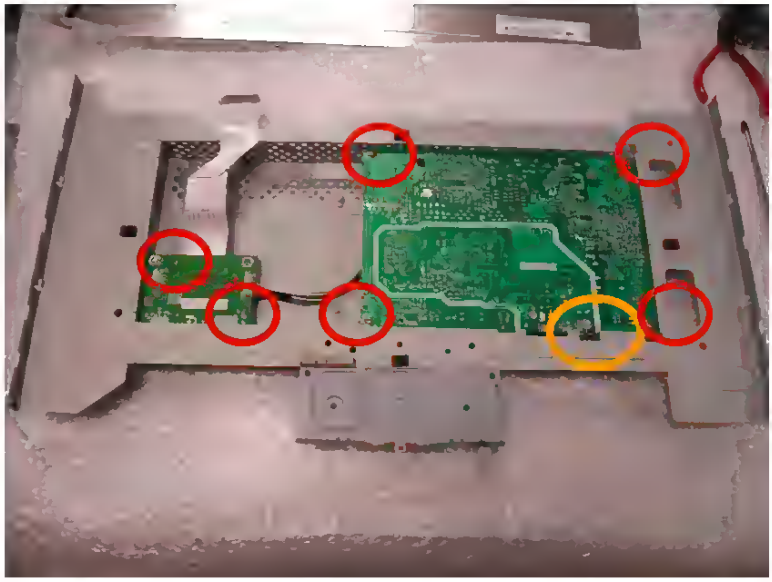
Step 3 : Sort LVDS wire and add 7 screws（dual input）

8F.00273.6R0	SCRW TAP PH F/10WSH M3*6L C-ZN	6
8F.VZ524.6R0	SCRW TAP FLAT+EXT M3*6L C-ZN	1



Step 4: Place main-shielding on the panel and connect LVDS into the panel and connect lamp wire into Power-BD

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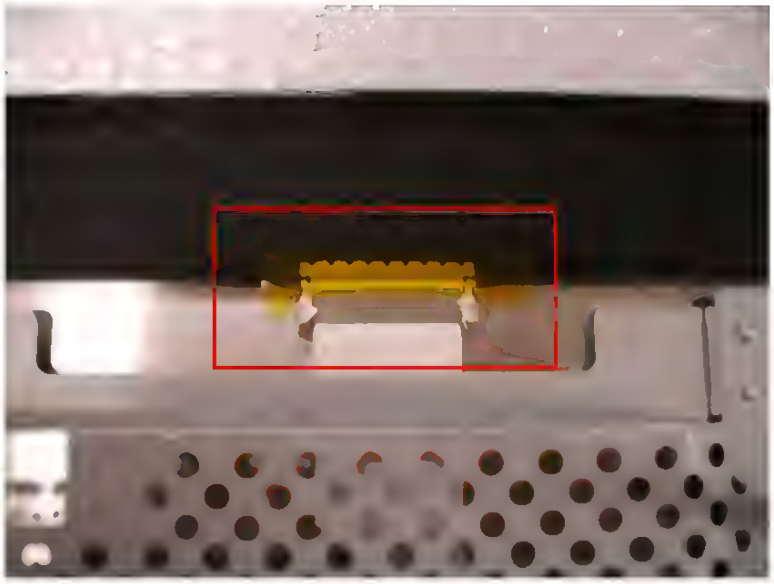
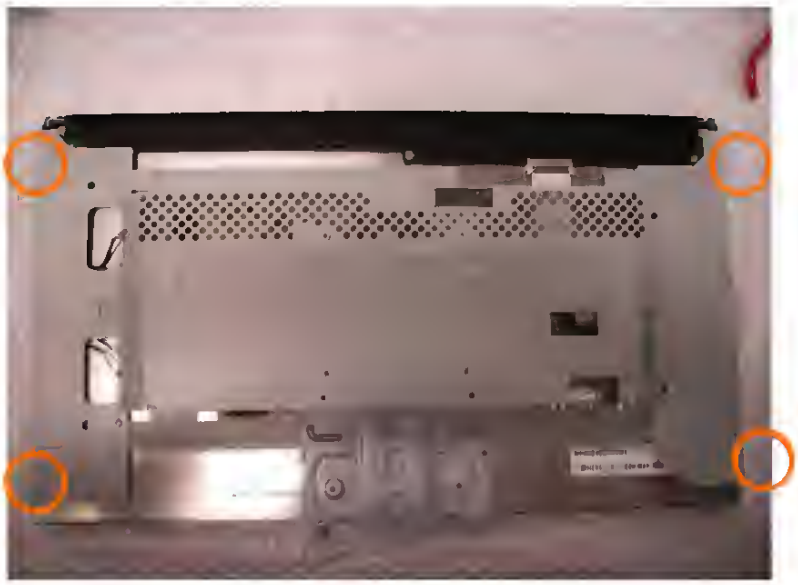
Step 5: Paste the tape at panel connector

3H.04121.001	TAPE 15*0.05MM KAPTON YEL	50mm



Step 6: Lock the side mount screw (4 pcs).

8F.5A224.6R0	SCRW MACH FLAT M3*0.5P*6L ZN	4



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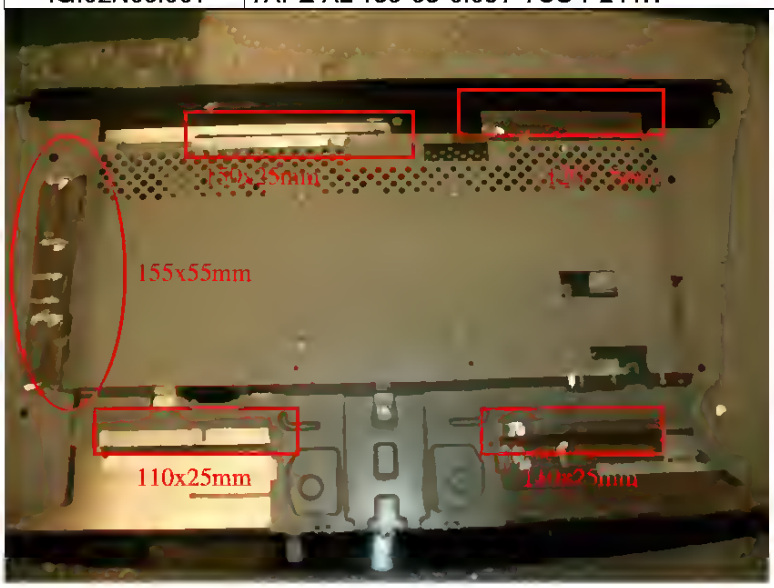
Step 7: Place 5pcs of AL-tapes on the four sides of main-shielding to protect EMI and Add TCO AL

4G.0F913.001	TAPE AL 110*25*0.08T V2400W	2
4G.0E308.001	TAPE AL 150*25*0.08 VW195	1
4G.0LN05.001	TAPE AL 120*45*0.08T P244W	1
4G.0LN06.001	TAPE AL 155*55*0.08T TCO P244W	1



Step8: Take one front-bezel and place the CTRL keypad and LED BD on the bezel

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Step9 : Connect the FFC of keypad into the interface board and fix the FFC with AL-tapes and lock the interface board using hex screw nut.

8F.205B4.019	SCRW MACH STEEL HEX #4-40 NI	4
4G.L0N02.001	TAPE-AL 40*20 L1755	1

Step 10 : Add gasket on the CTRL BD and lock one pc of screw to fix bezel and SHD.

4G.0LN04.001	GASKET 13L*13W*17H P244W	1
8F.WA314.8R0	SCRW TAP CAP M3*1.34P*8L B-NI	1

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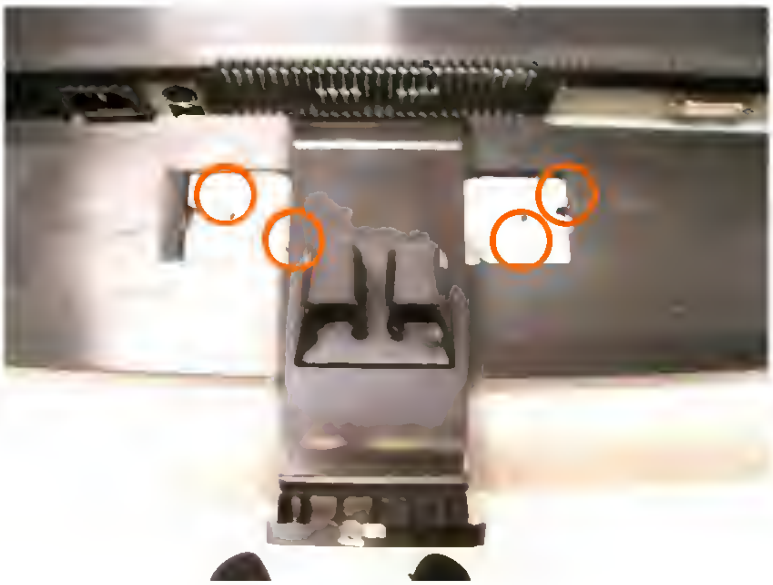
Step 11 : Assembly front-bezel and rear cover

Step 12 : Insert hinge and add 4 pcs of screws

8F.5A356.8R0	SCRW MACH FH M4*8L B-ZN NYL	4



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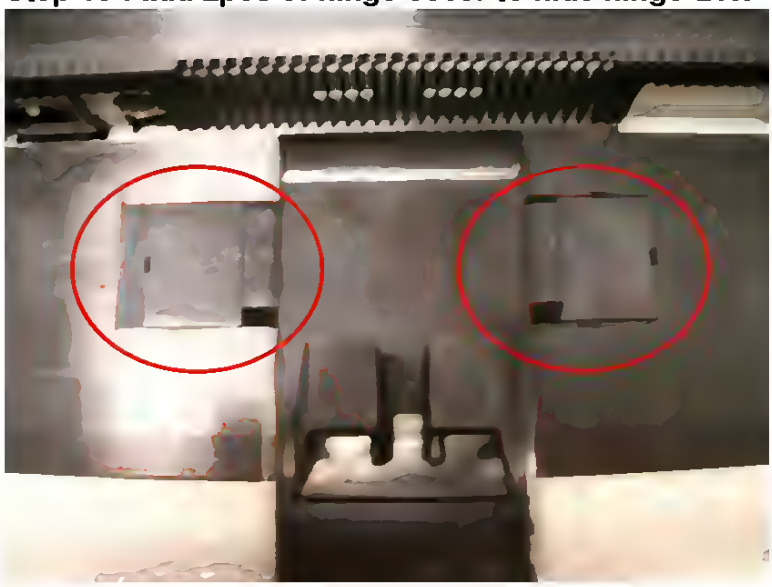
Step 13 : add 2pcs of hinge cover to hide hinge-BKT



Step 14 :Insert the assy-base into assy-column then use screw to fix them.

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Step 15 : finally , attached photos are the final front and back views of P244W

*** Disassembly flow would be working the flow backwards.**

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5. Level 1 Cosmetic / Appearance / Alignment Service

5.1 Alignment procedure (for function adjustment)

5.1.1 Preparation:

1.) Setup **input** timing to any preset modes or patterns.
2.) Enter factory mode (press "Empowering" & "Power" buttons at the same time to turn on monitor).
3.) Move cursor into "Burn-in Mode" tag and select "On" to enable burn-in mode.
4.) Power off the monitor, remove the input source and then power on again.
5.) Setup unit and keep it warm up for at least 30 minutes.
6.) Setup input timing ICL-605(1280x1024@75Hz), 32-Grays pattern.
7.) Setup unit and keep it warm up at least 30 minutes.

5.1.2 Timing adjustment:

1. Enter factory setting area (press "Empowering" and then press "SOFTPOWER").
2. Check the settings to following values:

   Contrast = 50
   Brightness = 77
   Color = Warm
   Language = English

   Then, turn off the monitor power.
3. Turn on power enter user area.

Figure-1: Preset Timing modes list

Mode	Resolution (active dot)	Resolution (total dot)	Horizontal Frequency (KHz)	Vertical Frequency (Hz)	Nominal Pixel Clock (MHz)
	640x480@60Hz	800 x 525	31.469	59.941	25.175
	640x480@72Hz	832 x 520	37.861	72.809	31.500
	640x480@75Hz	840 x 500	37.500	75.000	31.500
MAC	640x480@66.66Hz	864x525	35	66.66	30.24
VESA	720x400@70Hz	900x449	31.469	70.087	28.322
SVGA	800x600@56Hz	1024 x 625	35.156	56.250	36.000
	800x600@60Hz	1056 x 628	37.879	60.317	40.000
	800x600@72Hz	1040 x 666	48.077	72.188	50.000
	800x600@75Hz	1056x625	46.875	75.000	49.500
MAC	832x624@74.55Hz	1152x667	49.722	74.55	57.28
XGA	1024x768@60Hz	1344x806	48.363	60.004	65.000
	1024x768@70Hz	1328x806	56.476	70.069	75.000
	1024x768@75Hz	1312x800	60.023	75.029	78.750
MAC	1152x870@75Hz	1568x909	68.700	75.000	84.520
VESA	1152x864@75Hz	1600x900	67.5	75	108
	1280x960@60Hz	1800x1000	60	60	108

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SXGA	1280x1024@60Hz	1688x1066	63.981	60.020	108.000
	1280x1024@75Hz	1688x1066	79.976	75.025	135.000
VESA	1280x720@60Hz	1650x750	44.955	59.940	74.176
	1280x768@60Hz	1664x798	47.776	59.870	79.500
	1280x768@60Hz	1696x805	60.289	74.893	102.250
WXGA	1280x800@60Hz	1680x831	49.702	59.810	83.500
	1360x768@60Hz	1792x795	47.712	60.015	85.500
WXGA+	1440x900@60Hz	1904x931	55.935	59.887	106.500
	1440x900@75Hz	1936x942	70.635	75.000	136.750
UXGA	1600X1200@60Hz	2160x1250	75.000	60.000	162.000
WSXGA+	1680x1050@60Hz	2240*1089	65.290	59.954	146.250
	1680x1050@75Hz	2272*1099	82.306	74.892	187
UXGA	1600x1200@60Hz	2160x1250	75.000	60.000	162.000
	1920x1080@60Hz	2080x1111	66.587	59.934	138.5

5.1.3 ADC calibration (Auto color balance adjustment)
~~Analog only, it is not required for DVI-D input source

1. Setup input timing ICL-605(1280x1024@75Hz), pattern 42(5-Mosaic pattern with white color block) with Analog signals from Chroma video pattern generator. (it depends on Scaler IC supplier's recommendation)
2. Enter factory mode (press "Empowering" & "Power" buttons at the same time to turn on monitor).
3. Move cursor into "Burn-in Mode" tag and select "On" to enable burn-in mode.
4. Close OSD menu then press "Auto" button for auto color adjustment. (This procedure will get optimal gain/offset(clamp) values)
5. Checking if the picture is ok, or reject this monitor and check its circuit board or wire/cable connection.

5.1.4 Color temperature adjustment:

1. Setup input timing to any preset modes, pattern 41(full white color pattern) with Analog signals from Chroma video pattern generator.
2. Enter factory mode (press "Empowering" & "Power" buttons at the same time to turn on monitor).
3. Move cursor into "Burn-in Mode" tag and select "On" to enable burn-in mode.
4. Make sure ADC calibration (auto color balance adjustment) had already been done.
5. Measure color temperature by Minolta CA-110 (or equivalent equipment).
6. Adjust the color temperature ~~ Two methods can be used to adjust RED, GREEN, BLUE value of each color temperature, C0/Cool, C1/User & C2/Warm to meet following spec requirement, the 1st method is by using external PC and IIC alignment protocol to do automatic adjustment, and the 2nd method is by manually and must be in factory mode.

Color temperature (C0/cool on OSD)	X+-	0.283+(-) 0.03
	Y+-	0.297+(-) 0.03
	Luminance	> 180 cd/m²
Color temperature	X+-	
	Y+-	

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(C1/User on OSD)	Luminance	
Color temperature	X+-	0.313+(-) 0.03
	Y+-	0.329+(-) 0.03
(C3/Warm on OSD)	Luminance	> 220 cd/m²

7. Move cursor into "Burn-in Mode" tag and select "No" to disable burn-in mode.
8. Turns off the monitor power.

5.1.5 Writing EDID data into monitor

Analog:

1. Setup a **PC** with DDC card.
2. Connect PC to monitor with a D-sub signal cable.
3. Please refer to the C212 for the correct EDID file.
4. Runs the writing program to write the analog EDID data into EEPROM for analog input(ie. 15-pin D-sub).

HDMI

1. Setup a PC with DDC card.
2. Make a HDMI cable that 18th pin is connected to +5V and 19th pin is connected to Ground.
3. Connect PC to monitor with this HDMI signal cable.
4. Please refer to the C212 for the correct EDID file.
5. Runs the writing program to write the HDMI EDID data into EEPROM

(Note: The HDMI input may not operation correctly if the digital EDID data do not exist.)

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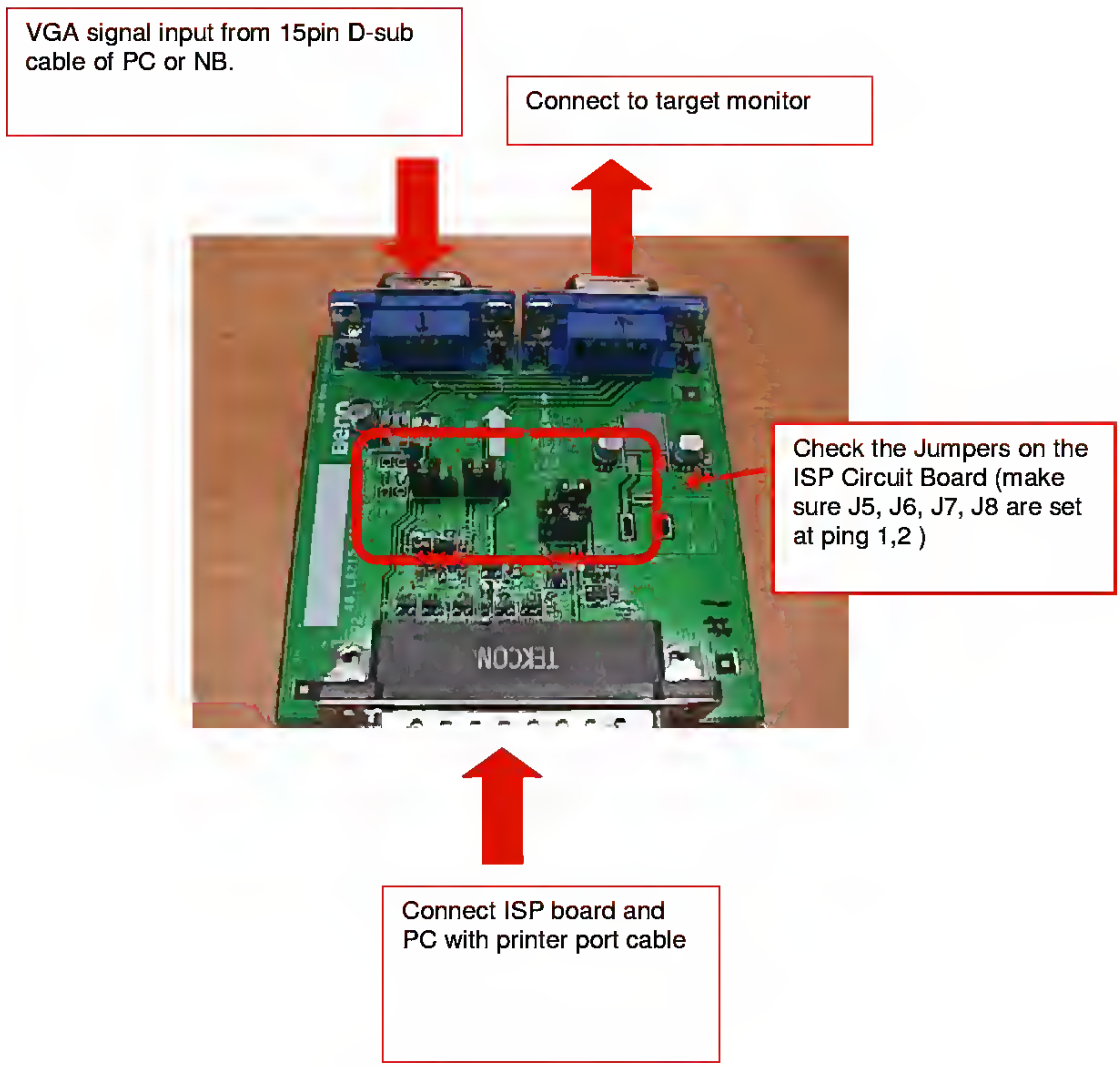
5.2 Software / Firmware Upgrade Process

5.2.1 Hardware prepared:

Hardware Requirement:

1. ISP board x 1


VGA signal input from 15pin D-sub cable of PC or NB.
Connect to target monitor
Check the Jumpers on the ISP Circuit Board (make sure J5, J6, J7, J8 are set at ping 1,2)
Connect ISP board and PC with printer port cable

2. DSUB VGA cables x 2
3. Printer cable (with one male connector and another female connector) x 1.
4. PC or Notebook with parallel (printer) port x1.

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5.2.2 Firmware Upgrade Procedure

Step 1:

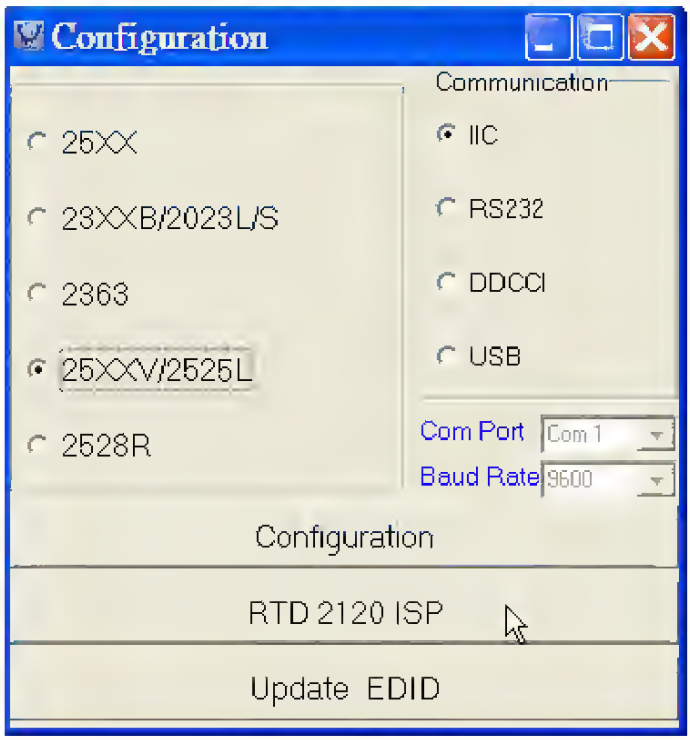
Un-zip Port95nt and install into your computer.

Step 2:

Un-zip ISP application tool (RTDTool)

Step 3:

Press “RTD 2120 ISP” button to execute firmware program application.



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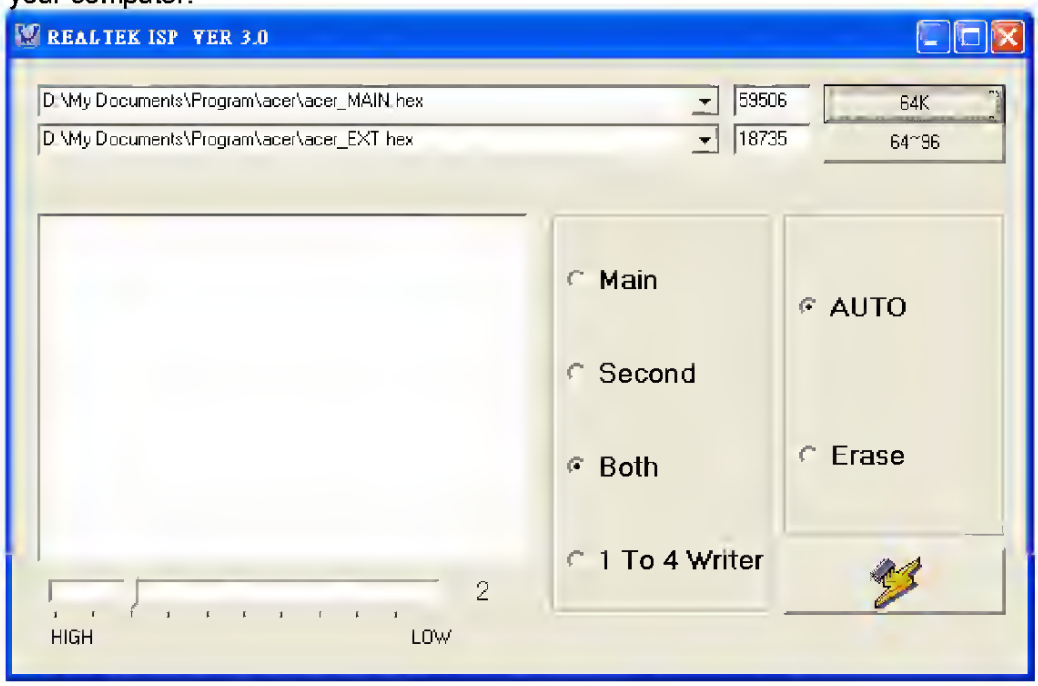
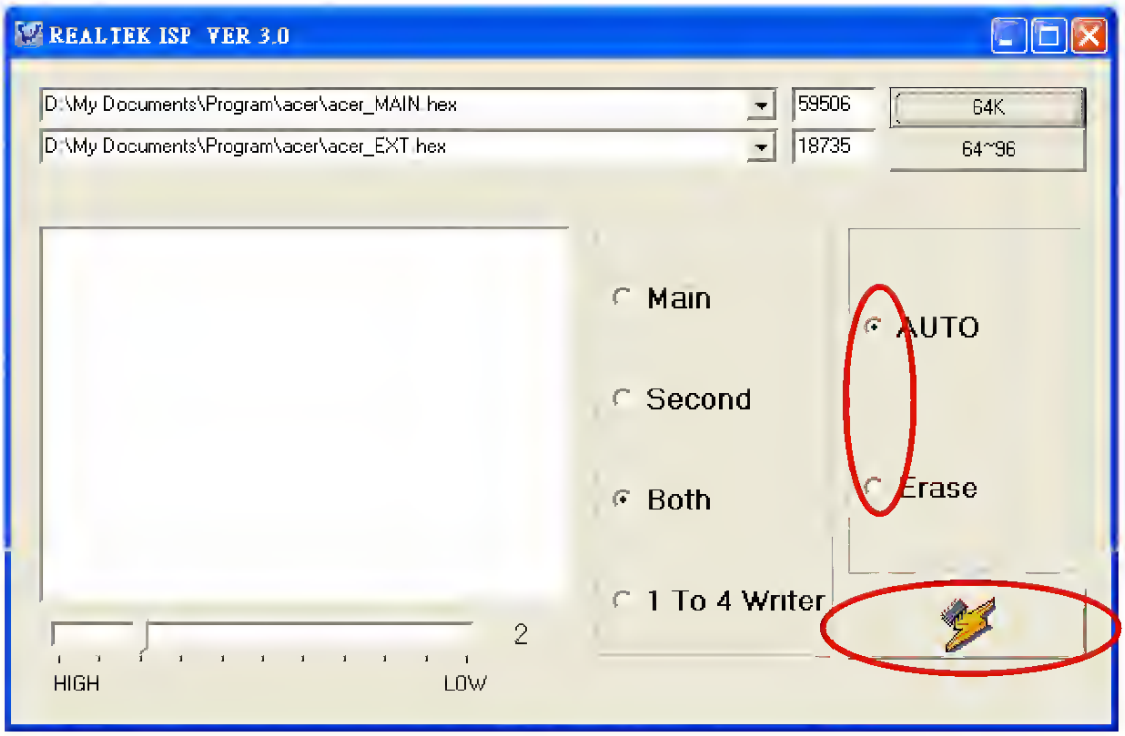
Step 4:

Press “64K" button to load *series*.hex file and press “64~96" button to load *extend*.hex file from your computer.



Step 5:

Select “Erase” option and execute lightning button first, and then select “Auto” option and execute lightning button to start upgrade firmware to the monitor.



Note: you can change program speed bar to meet your equipment speed if program firmware fail.

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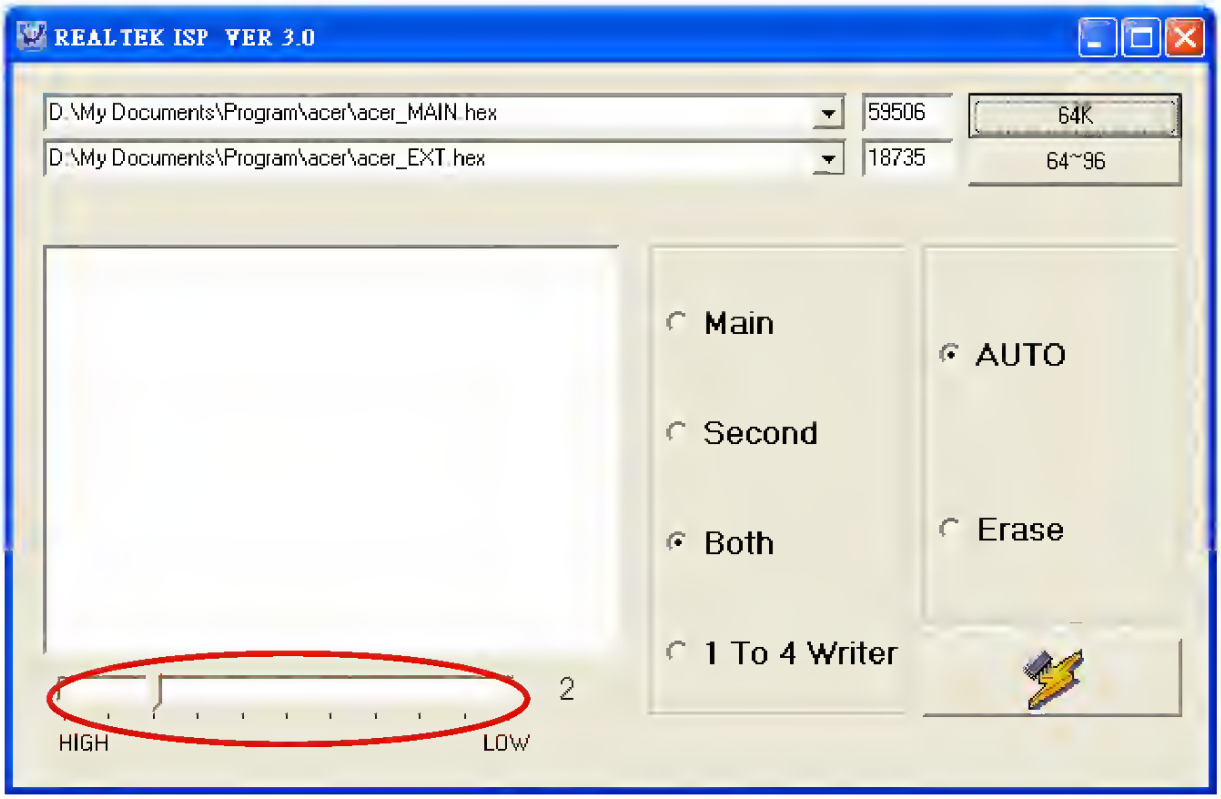

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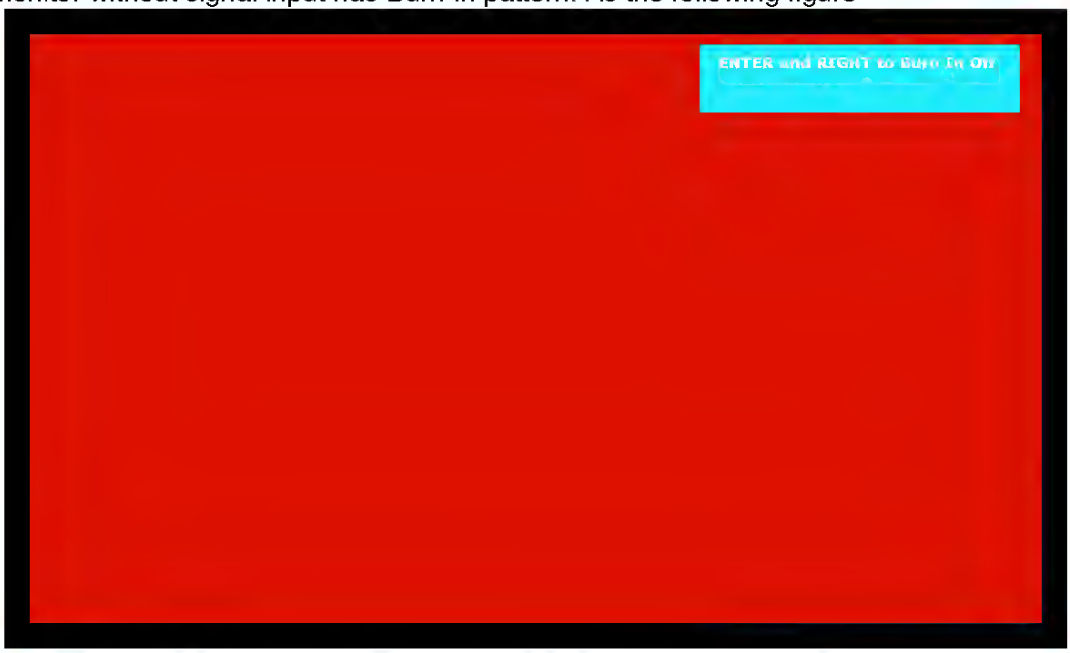
5.2.3 Turn Off Burn In

IF the monitor without signal input has Burn In pattern. As the following figure



Press “MENU” and “>” key at the same time to exit Burn in mode(factory mode),and soft power key off/on restart the monitor.

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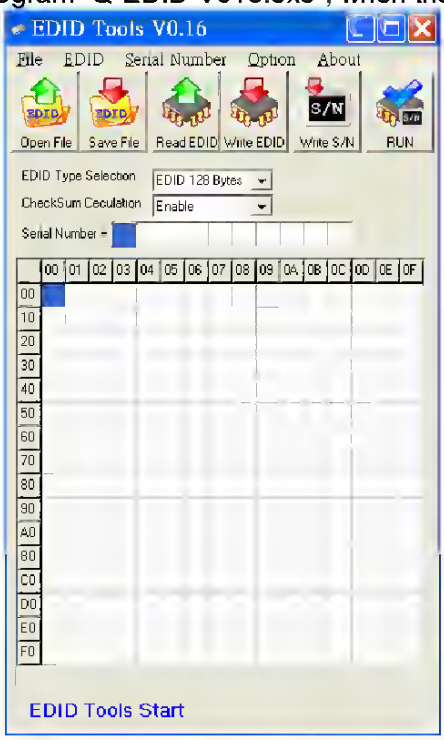
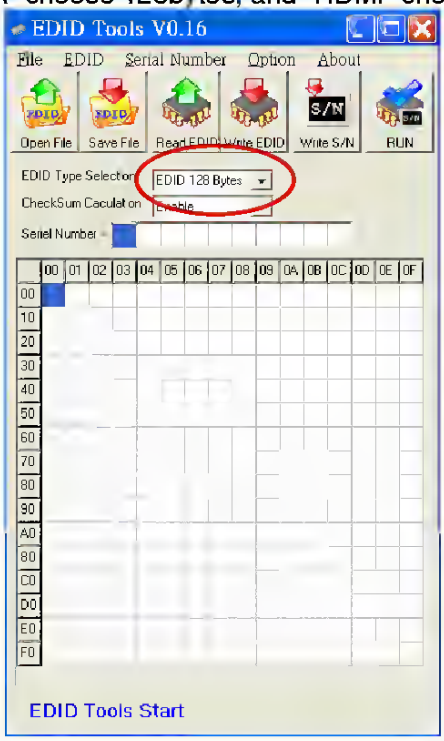
5.3 EDID Upgrade Procedure

Step 1:

Run the program "Q-EDID-V016.exe", when the UI popped up



Note: If "VGA" choose 128bytes, and "HDMI" choose 256bytes



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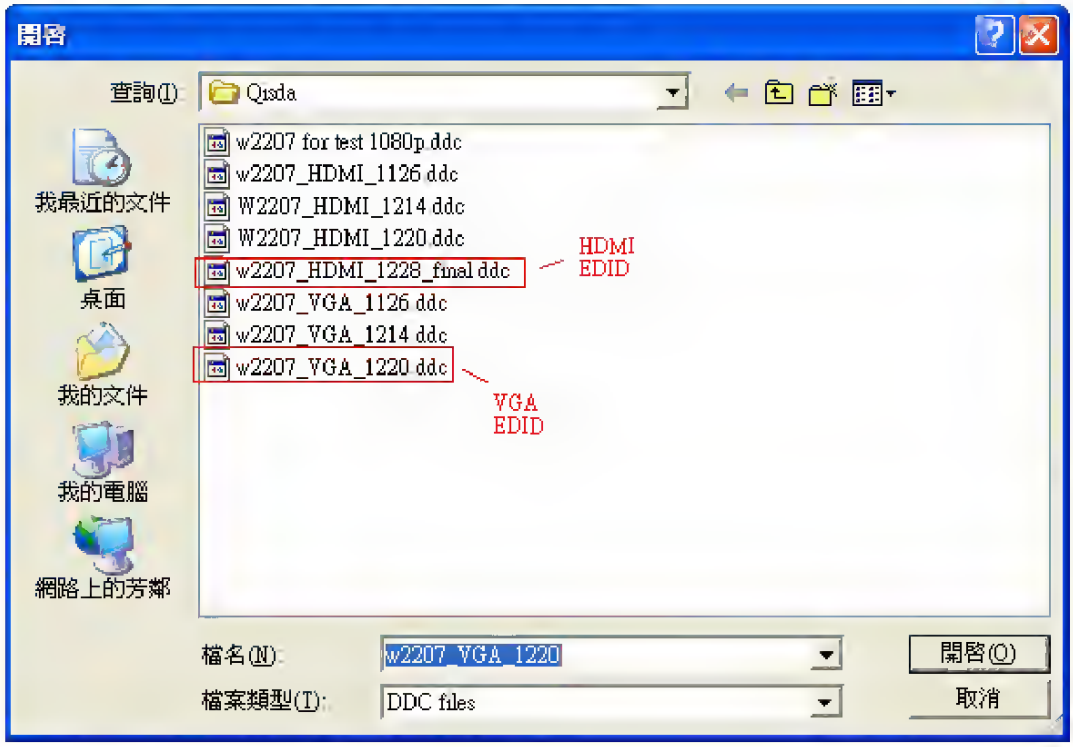
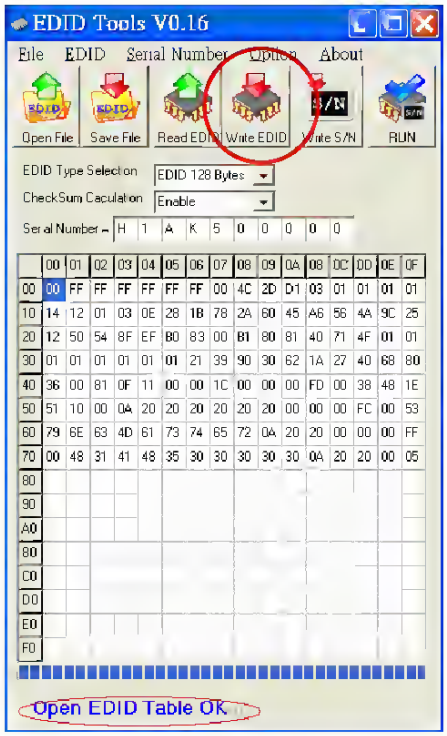
Step 2:

Click "Open File" and select "VGA" or "HDMI" EDID file



Step 3:

If load file is successful, it shows "Open EDID Table OK." And then, Click "Write EDID" button to update EDID



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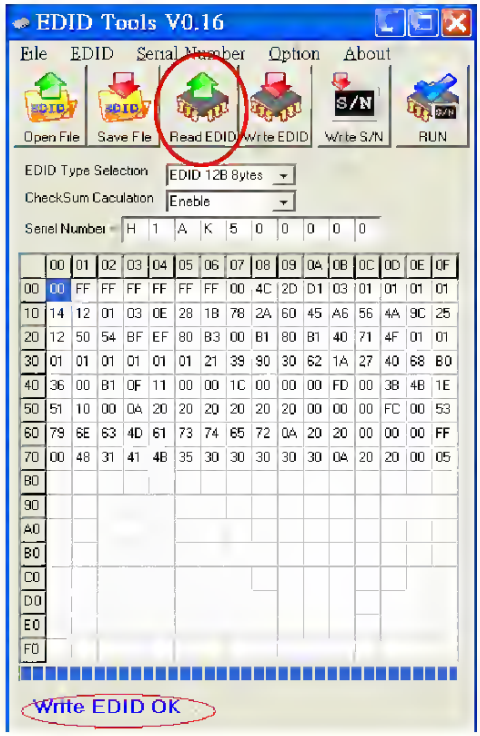
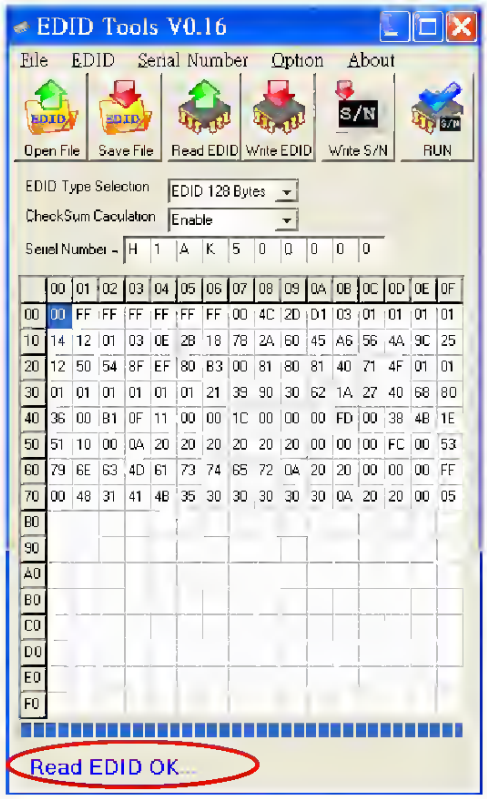
Step 4:

If write EDID is successful, it shows "Write EDID OK ..."
And then, click "Read EDID" button to check if successful or not.



Step 5:

If read EDID is successful, it shows" Read EDID OK ..."



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5.4 OSD Operation Guide

1-1 Main menu OSD

1-1-1 OSD layout

a. Display OSD menu when user press "MENU" button on front bezel

b. Layout as following figure 1-1

Figure 1-1 OSD layout for main menu

c. OSD layout for each function page

Picture

OSD

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Settings

Information

d. The definition of size and color for main menu

Figure 1-2 Color & size definition for function Icons

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Figure 1-3 Color & size definition for hover at item page

Figure 1-4 Color & size definition for selected status at item page

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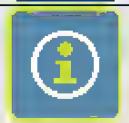
e. Icons introduction

Function / Status	Picture	OSD	Setup	Information
Non-Foucs				
Focus				
Focus on Item-page				

f. Item page status

Status	Display type
Non-focus	
Item focused	
Item selected	

1-1-2 Key operation

a. Key operation at function icon

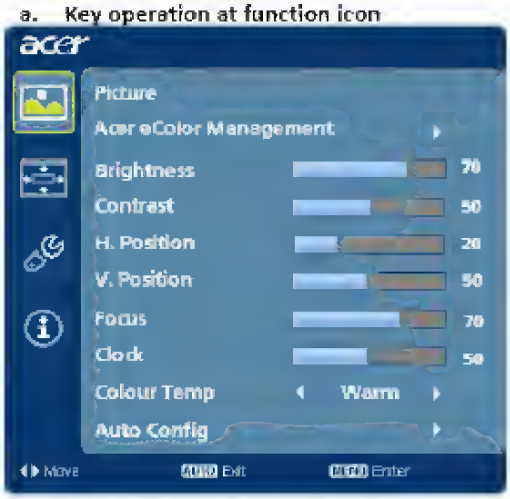


Figure 1-5 Foucs at main icons

Key	Function description
Power	Power off the monitor
<	Moving the focus up
>	Moving the focus down
Menu	Enter to the item page
Auto	Exit the OSD menu
e	Trigger the acer eColor Management

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b. Key operation at items page, No item selected

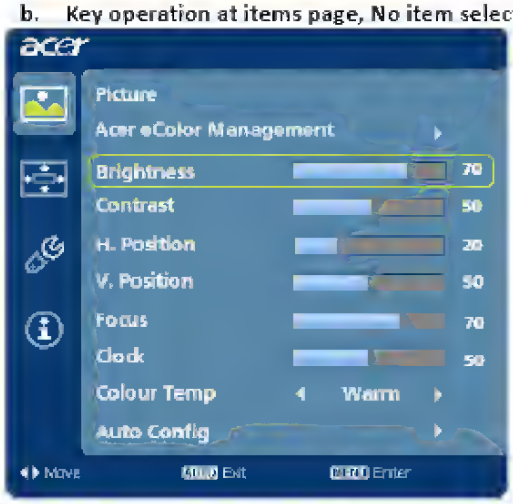

Figure 1-6 Foucs at item page

Key	Function description
Power	Power off the monitor
<	Moving the focus up
>	Moving the focus down
Menu	Select function item for adjustment
Auto	Exit from the item page to icon place
e	Trigger the acer eColor Management

c. Key operation at items page, item selected

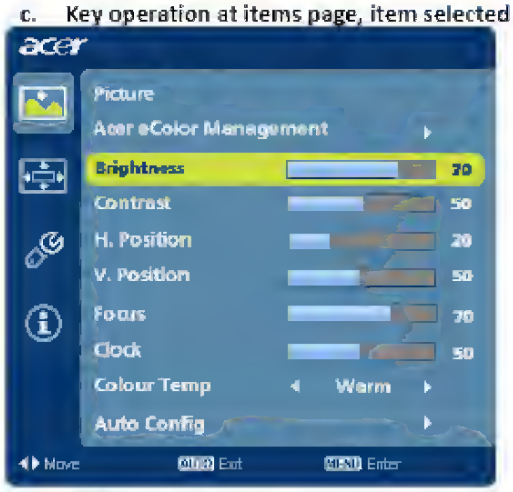

Figure 1-7 Item is selected

Key	Function description
Power	Power off the monitor
<	Increase the setting value for target itme
>	Decrease the setting value for target itme
Menu	No function
Auto	Exit from item selected status
e	Trigger the acer eColor Management

1-2 Acer eColor management

a. Display acer eColor Management OSD when user press "e" button on the front bezel or trigger this function in OSD menu/picture page.

b. Layout as following figure 1-8

Figure 1-8 OSD layout for the acer eColor management

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c. The definition of color & size for the acer eColor management OSD

d. Icon introduction

Icons					
Name	User	Text	Standard	Graphics	Movie
Sieze	60x54Pixes				

Remark: Acer logo must be appeared while "power on" or "suspend"

1-3 OSD Message

Item	Description
Auto Config Please Wait	When User Press Hot-Key "Auto", will show this message, and the monitor do the auto config function.
Input Not Supported	When the Hsync Frequency, Vsync Frequency or Resolution is out of the monitor support range, will show this message. This message will be flying.
Cable Not Connected	When the video cable is not connected, will show this message. This message will be flying.
No Signal	When the video cable is connected, but the is no active signal input, will show this message, then enter power saving.
Please Wait	After user trigger the reset function, system will show this message to notice user the reset is in proceeding

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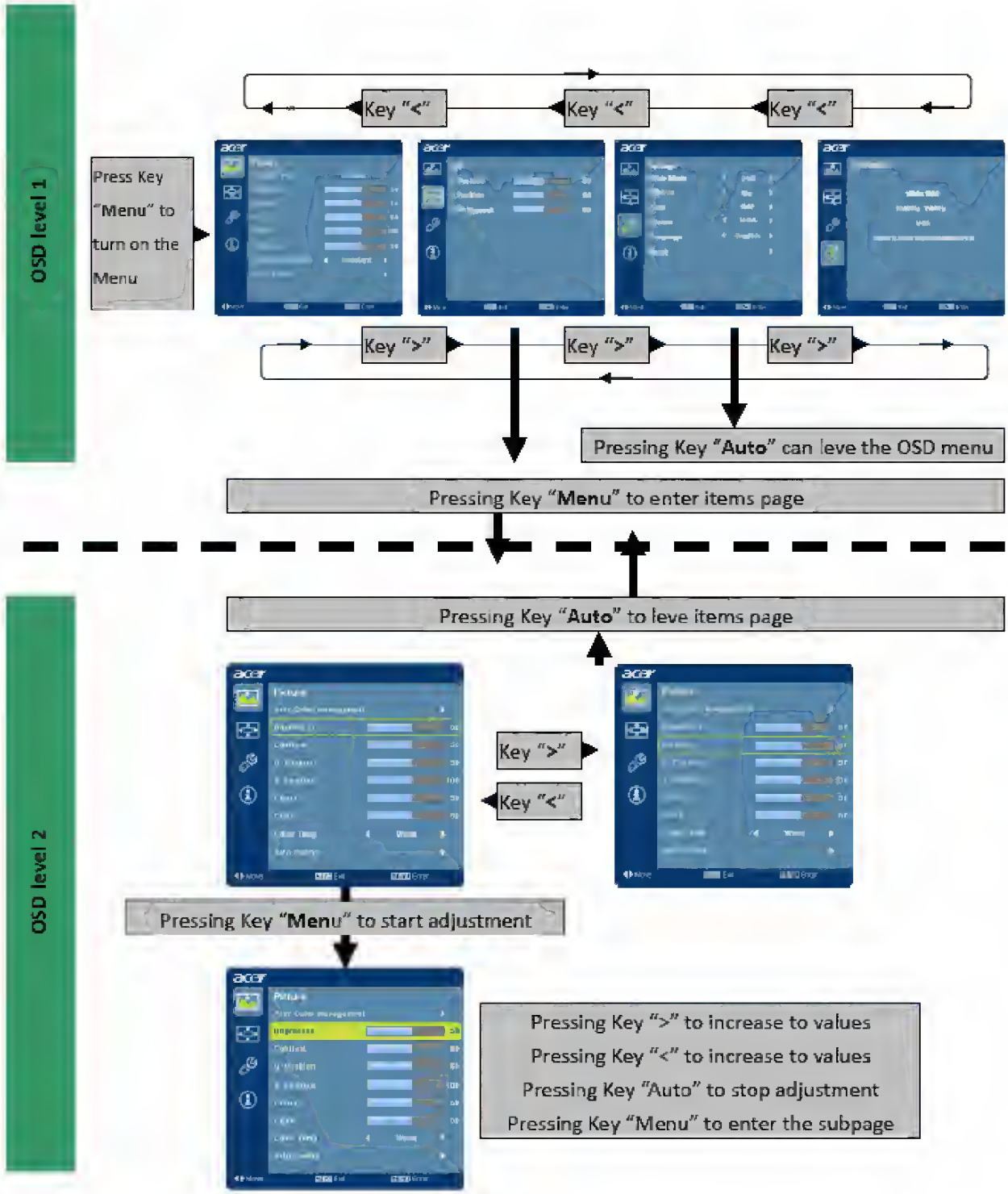
1-4 OSD Operation Flow

1-4-1 Main Flow



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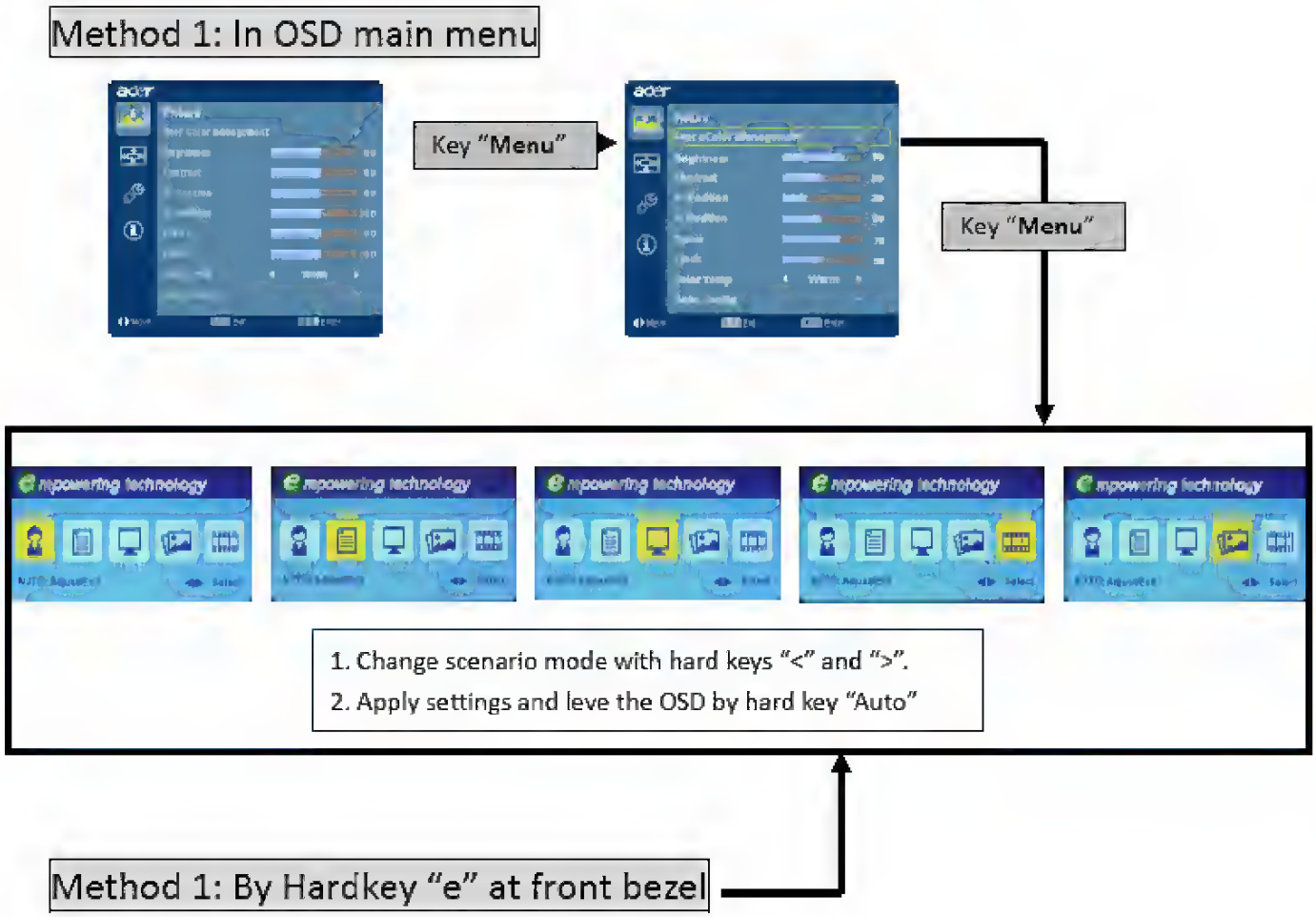
1-4-2 Active the Acer eColor Management


Method 1: In OSD main menu
Key "Menu"
Key "Menu"
1. Change scenario mode with hard keys "<" and ">".
2. Apply settings and leve the OSD by hard key "Auto"
Method 1: By Hardkey "e" at front bezel

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1-4-3 Reset Flow

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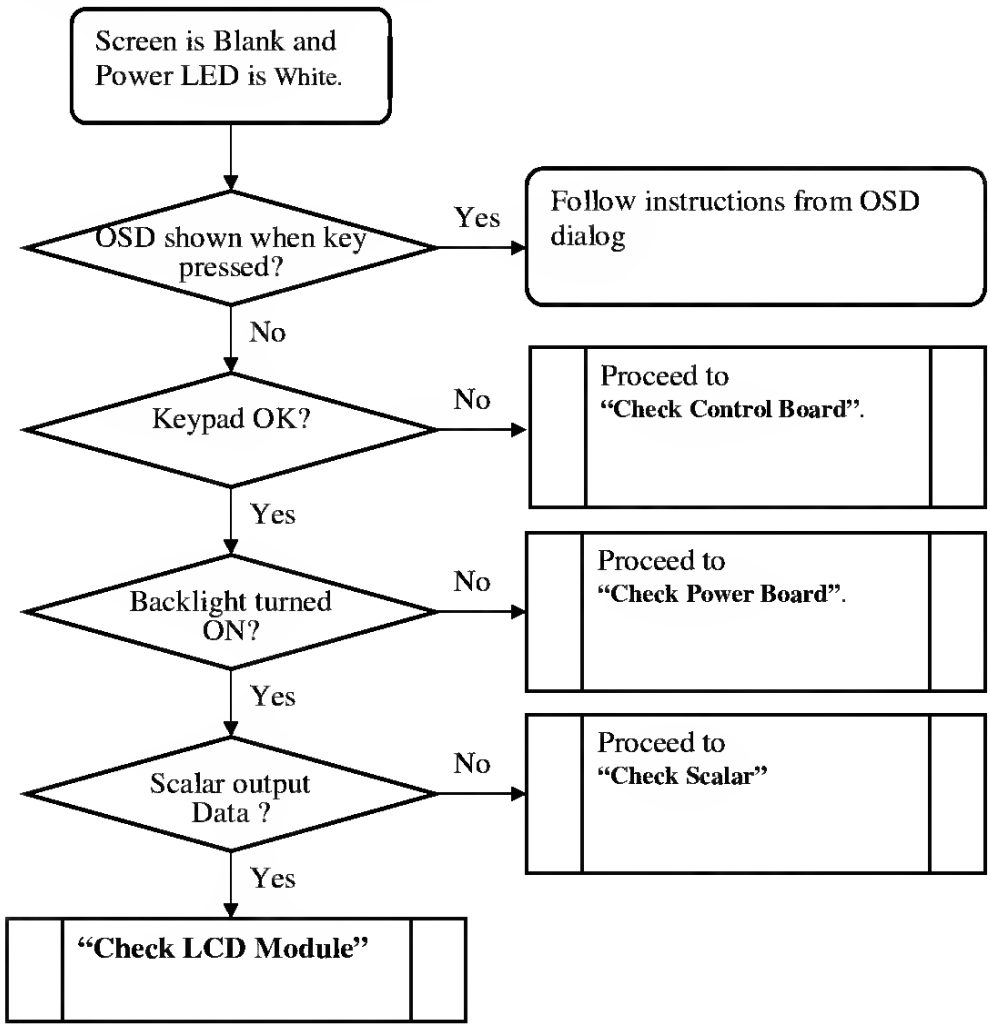
6. Level 2 Circuit Board and Standard Parts Replacement

6.1. Trouble Shooting Guide

1. No Display or display is unstable (Interface Board):



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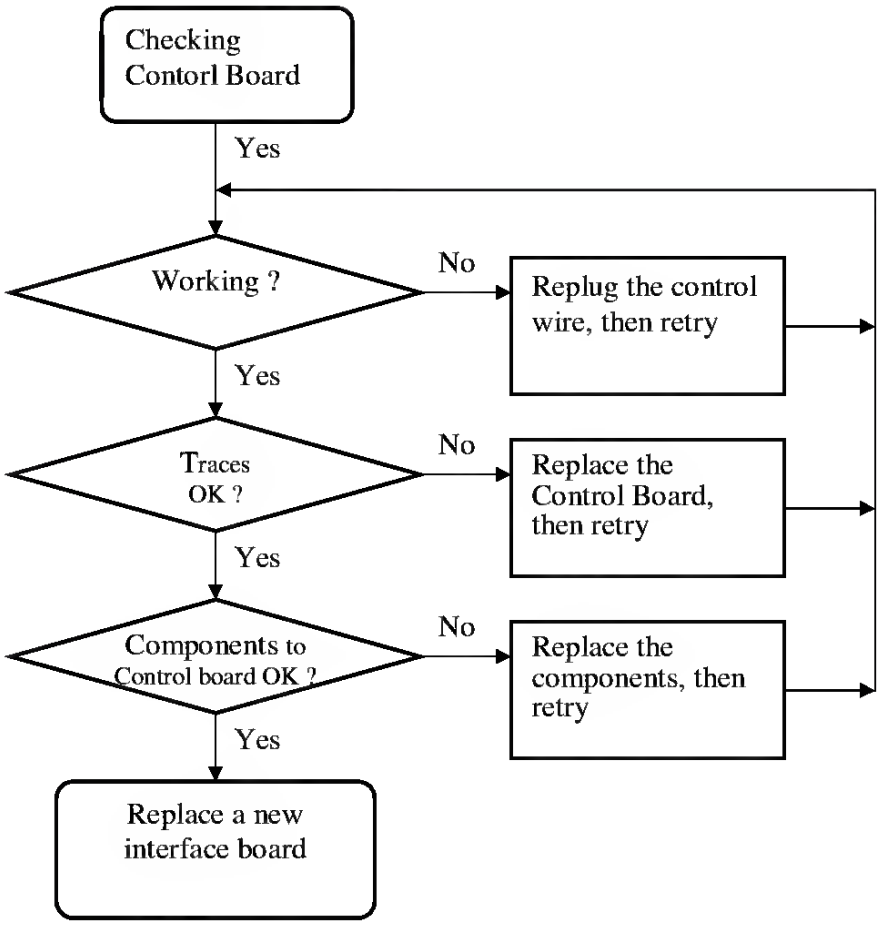
2. Check Control Board



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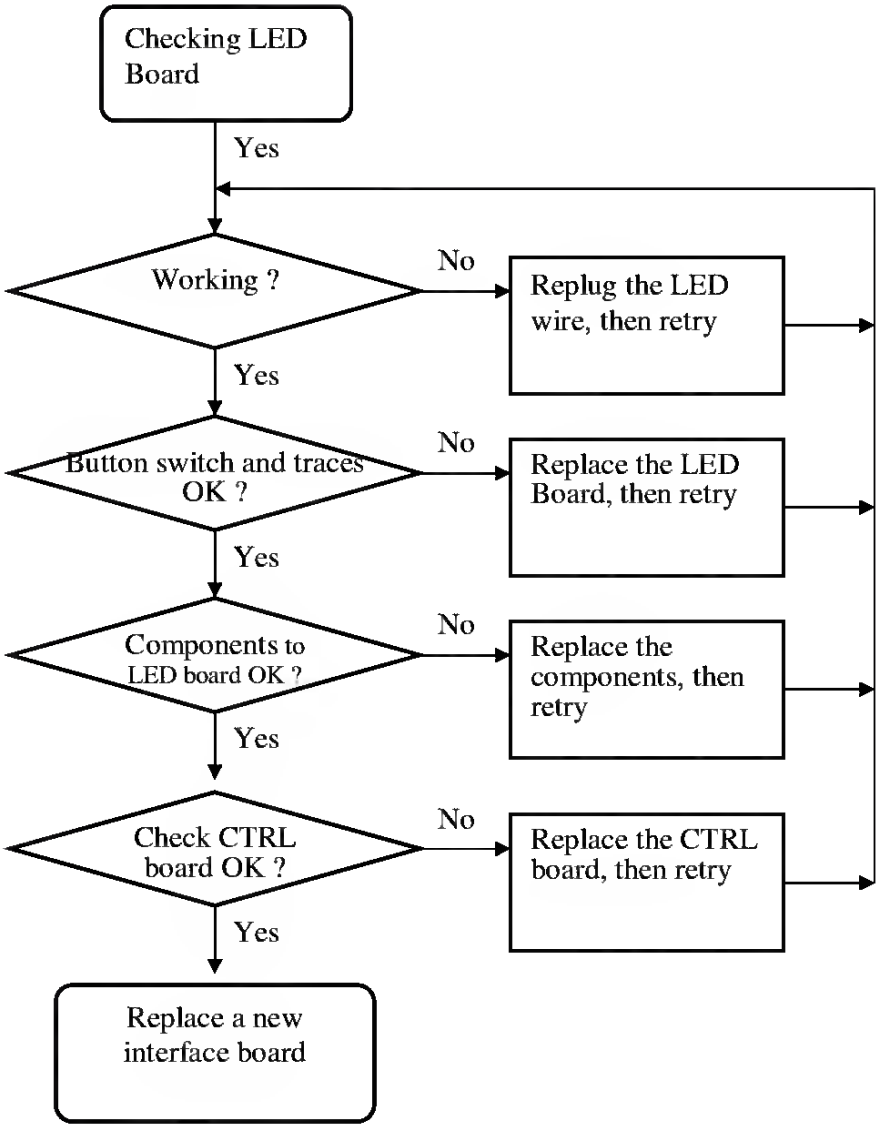
3. Check LED Board



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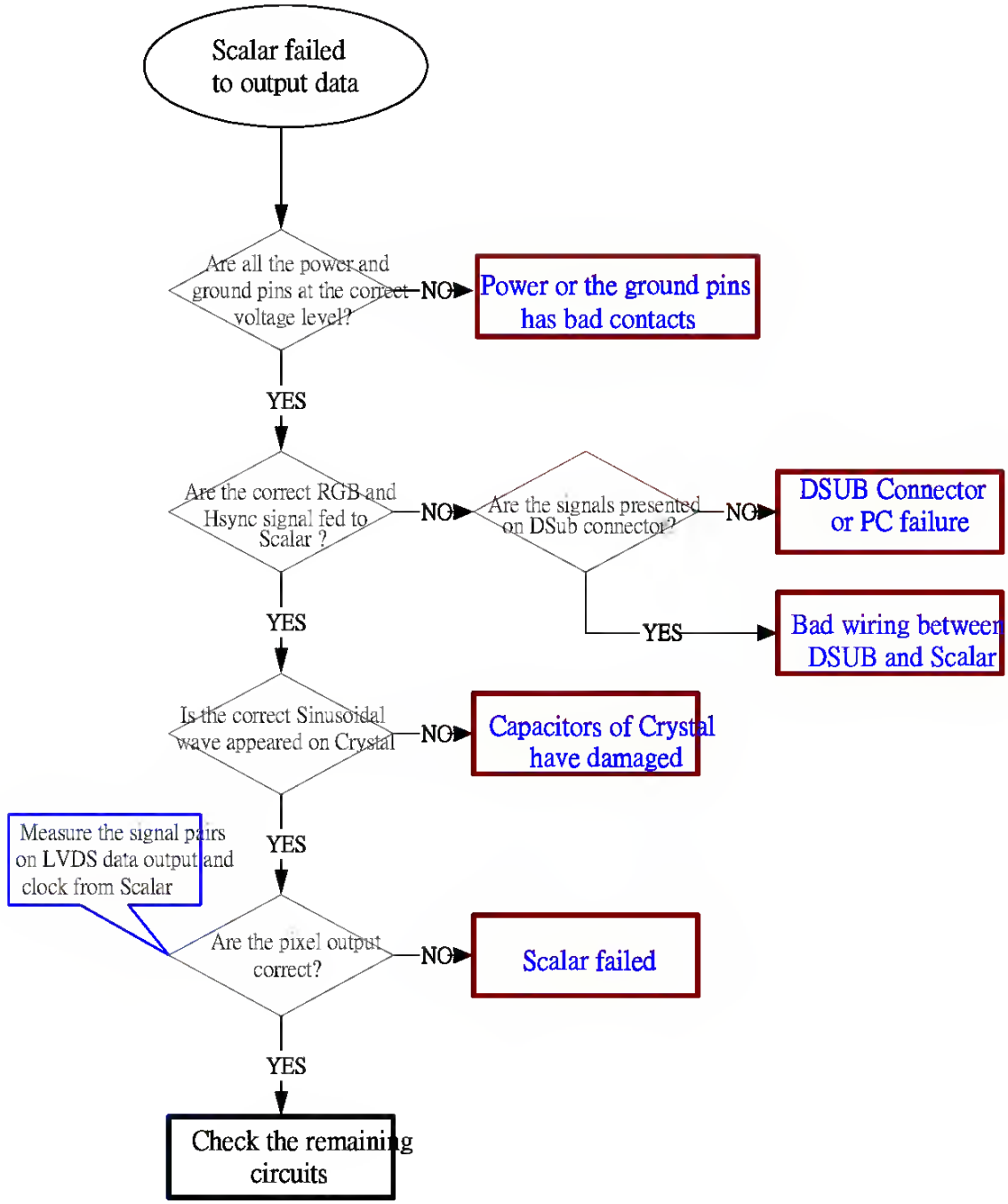
4. Check Scalar


Scalar failed to output data
Are all the power and ground pins at the correct voltage level?
NO
Power or the ground pins has bad contacts
YES
Are the correct RGB and Hsync signal fed to Scalar ?
NO
Are the signals presented on DSub connector?
NO
DSUB Connector or PC failure
YES
Bad wiring between DSUB and Scalar
YES
Is the correct Sinusoidal wave appeared on Crystal
NO
Capacitors of Crystal have damaged
YES
Measure the signal pairs on LVDS data output and clock from Scalar
Are the pixel output correct?
NO
Scalar failed
YES
Check the remaining circuits

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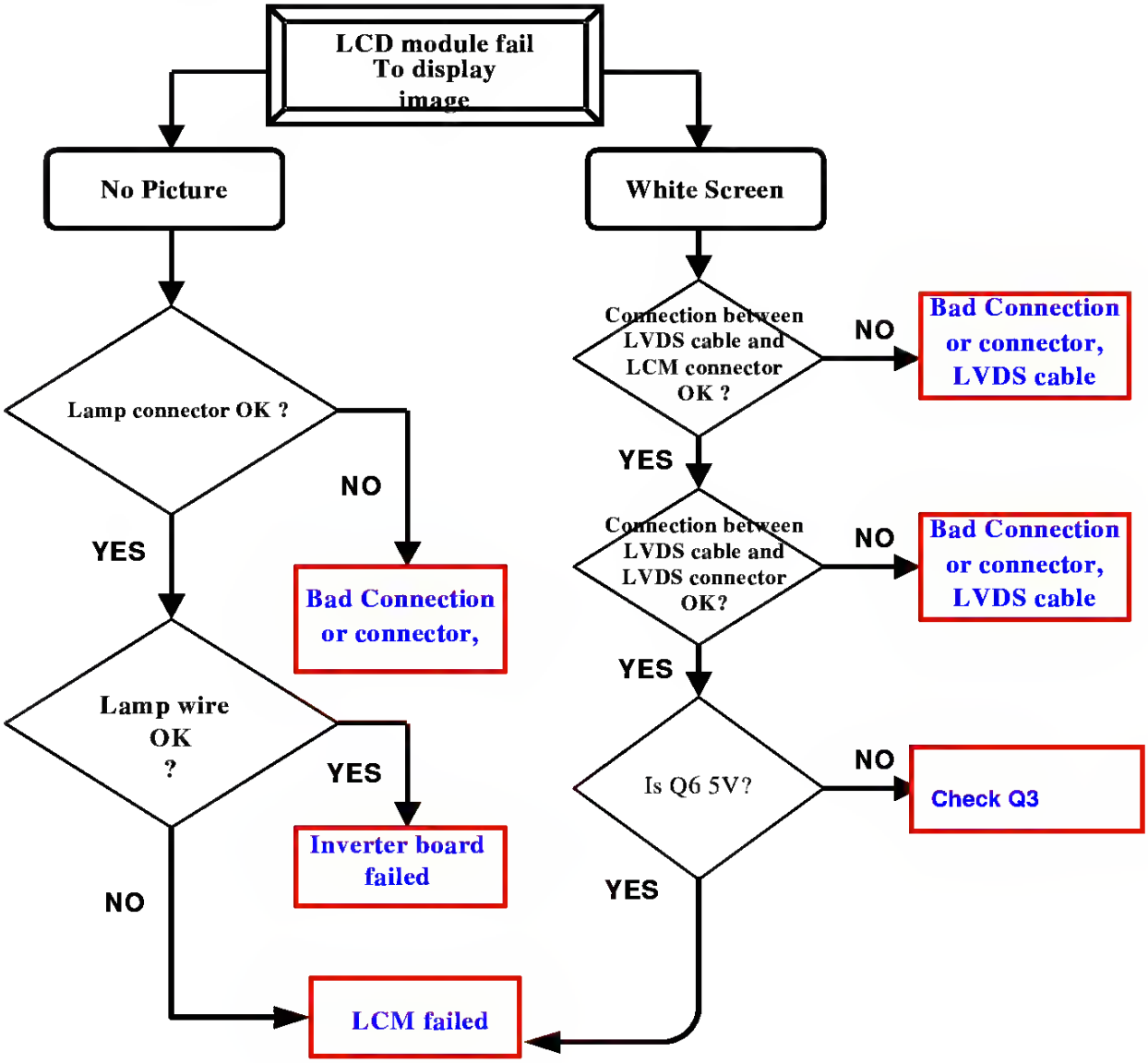
5. Check LCD Module



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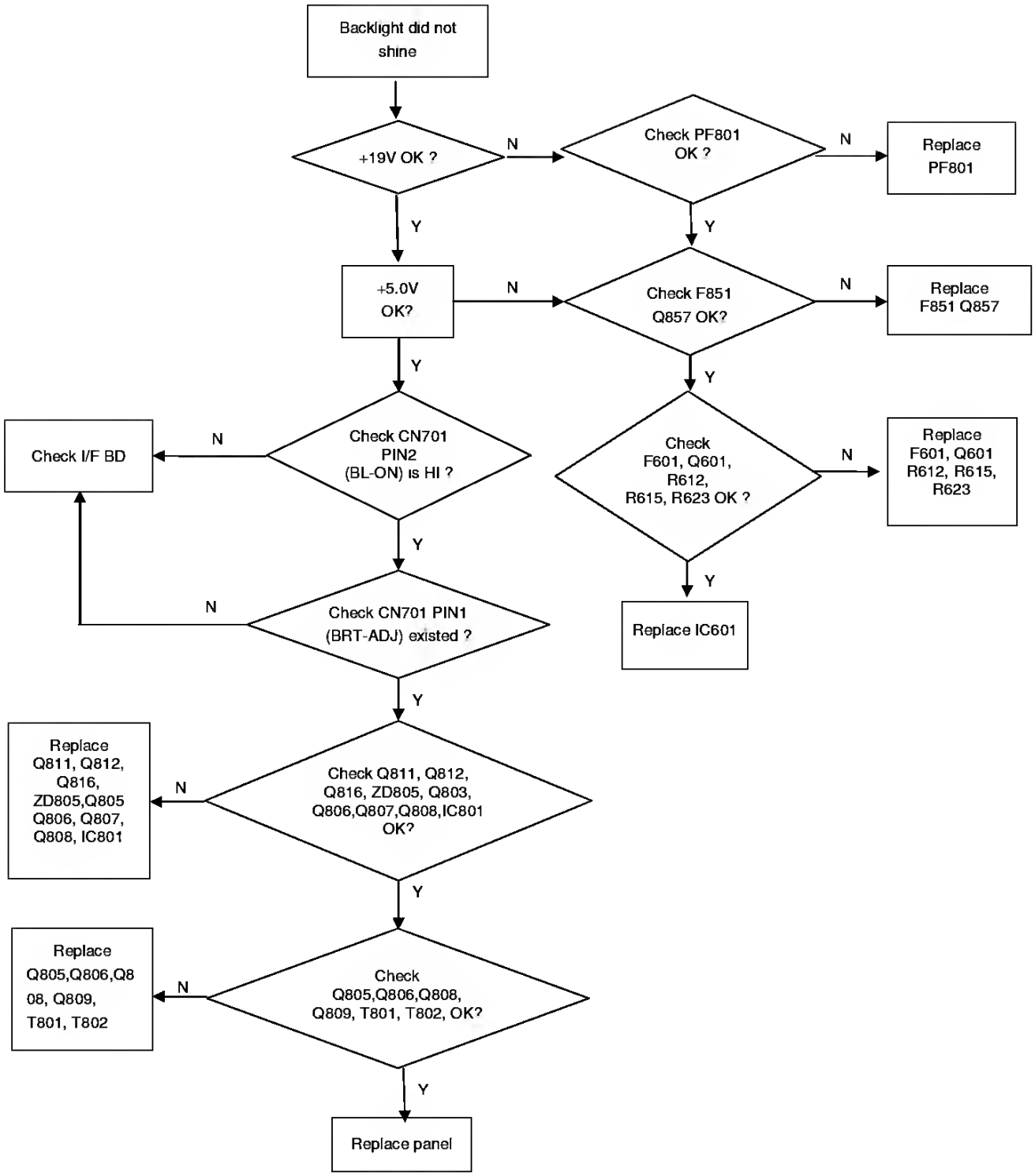
6. Power Board Functions:



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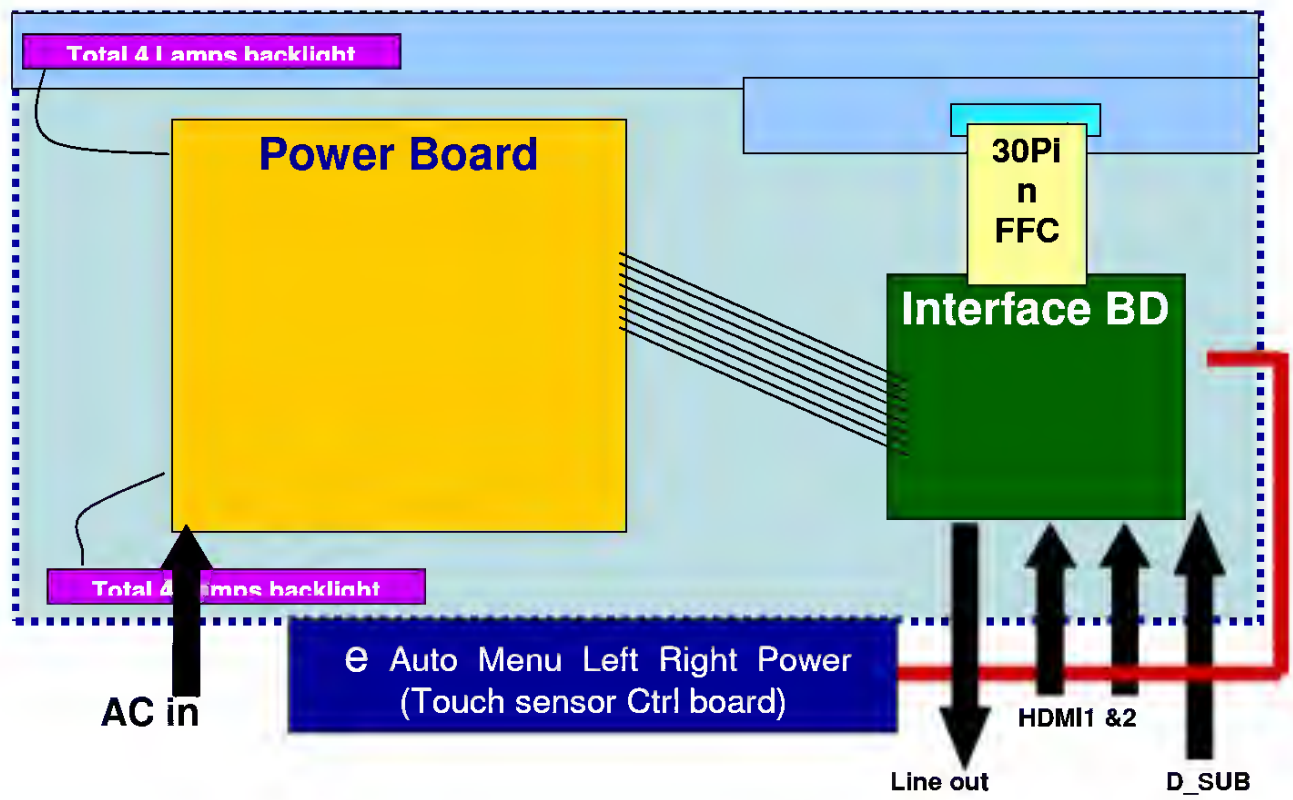
6.2 Circuit Operation Theory

I. Introduction:

The P244W is a 24" W (1920x1080), LCD type is TN+Film and Normally White, 16.7M colors(R, G, B 6-bit data + Hi-FRC data) TFT LCD with HDCP support monitor. It's have triple (D-SUB and 2 HDMI) interface LCD monitor with a 15 pins D-sub signal cable. It's compliant with VESA specification to offer a smart power management and power saving function. It also offers OSD menu for users to control the adjustable items and get some information about this monitor. The best function is to offer users an easy method to make Auto Adjustment items well done just by pressing hot key, we called it "Auto" which can manual controlled items.
P244W also offer DDC/CI function to meet VESA standard.

II. Block diagram

The P44W consists of a LCD module with 4 lamps, a power board, a control board, and an interface board. The block diagram is shown as below.



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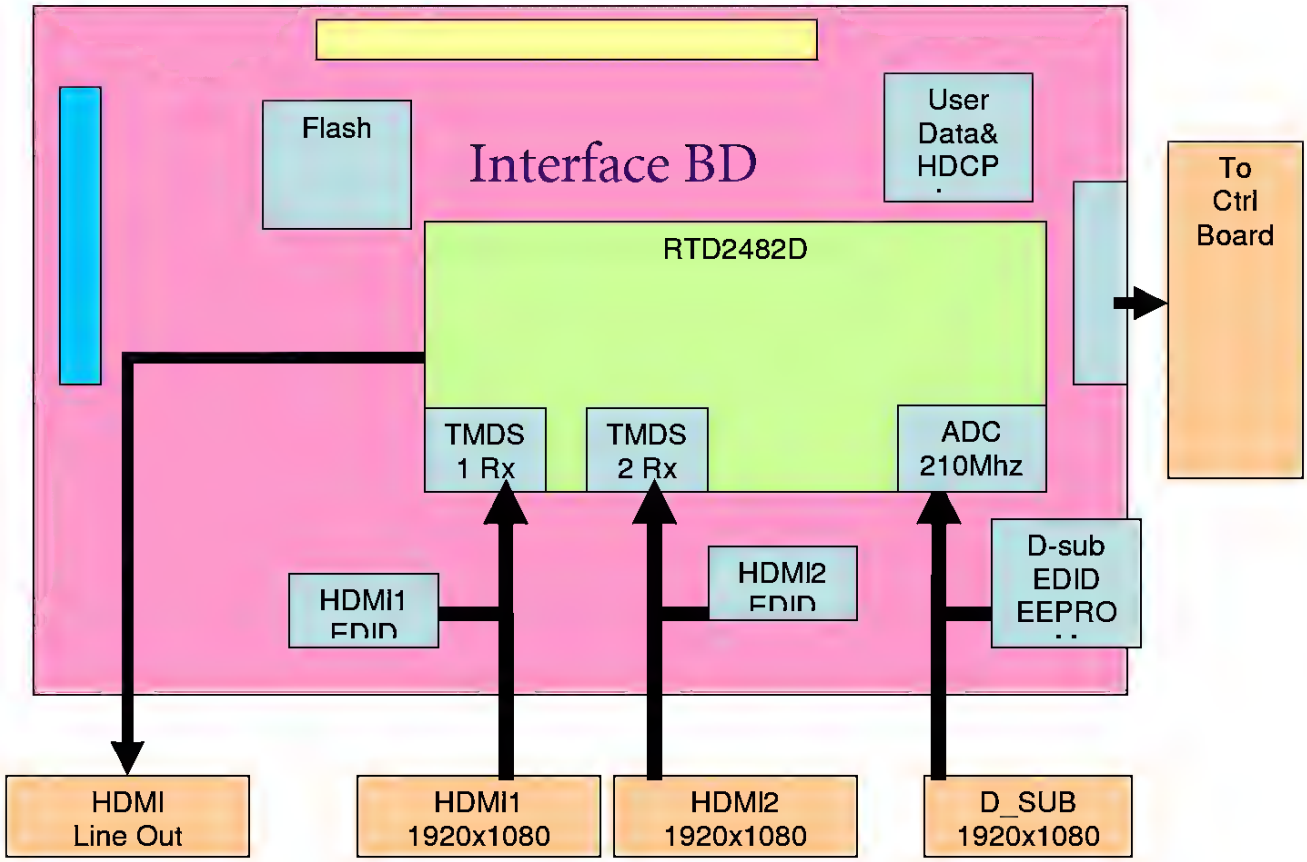
III. Circuit operation theory:

A-1.) Interface board diagram:



(a) Circuit operation theory:

A basic operation theory for this interface board is to convert analog signals of Red, Green and Blue to digital signals of Red, Green and Blue. The scaling IC has internal A/D converter, internal OSD, built in LVDS transmitter and auto-detect input timing functions. A/D converter is convert analog signal to digital data. OSD is offering adjustable functions to end-user. Detect timing is for detect change mode. LVDS transmitter is used to compress the digital RGB data, the Hsync, Vsync and pixel clock generated by Scaling then output to LCD module. MCU stores source code and offers H/W DDC2Bi function & controls system processing. EEPROM is stored DDC and HDCP data, OSD common data and user mode data.

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(b) IC introduction:

1.) DDC (Display Data Channel) function: We use DDC IC to support DDC2Bi function. DDC data is store in 24C02 (EEPROM). Those data related to LCD monitor specification. PC can read them by "SDA" and "SCL" serial communication for I²C communication for DDC2Bi.

2.) Scalar IC: There are A/D, TMDS receiver, HDCP, Scaling, info frame recognizer, OSD and LVDS transmitter functions built-in the RTD2482D IC. Scaling IC is revolutionary scaling and color engine, capable of expanding any source resolution to a highly uniform and sharp image or down scaling, combined with the critically proven integrated 8 bit triple-ADC and patented Rapid-lock digital clock recovery system. It also support detect mode and DPMS control. RTD2482D is also MCU-embeeded.: Control unit, it controls all the functions of this interface board, just like the OSD display setting, the adjustable items, adjusted data storage, the external IIC communication, support DDC2Bi. .

3.) EEPROM: We use 24C016 to store all the adjustable data, user settings and HDCP Key and use 3 of 24C02 to store HDMI x 2 and D-SUB EDID data.

A-2.) Control board introduction:

There are 5 keys for user's control which includes "Menu", "Right", "Left", "Auto", and "Empowering". The following descriptions are the introduction of these keys.

(1) "Menu" key: to enter sub-menus or select items.

(2) "Right" key: to select previous and to increase adjustment

(3) "Left" key: to select next and to decrease adjustment

(4) "Auto" key: to perform auto adjustment and Exit key

(5) "Empowering": to Open the Acer eColor Management OSD and access the scenario

A-3.) LED board introduction:

(1) Power key: to turn/off power of monitor

(2) LED: It indicates the DPMS status of this LCD monitor; green light means DPMS on (Normal operating condition). Amber light means DPMS off (Power Saving).

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A-3.) Power board diagram:

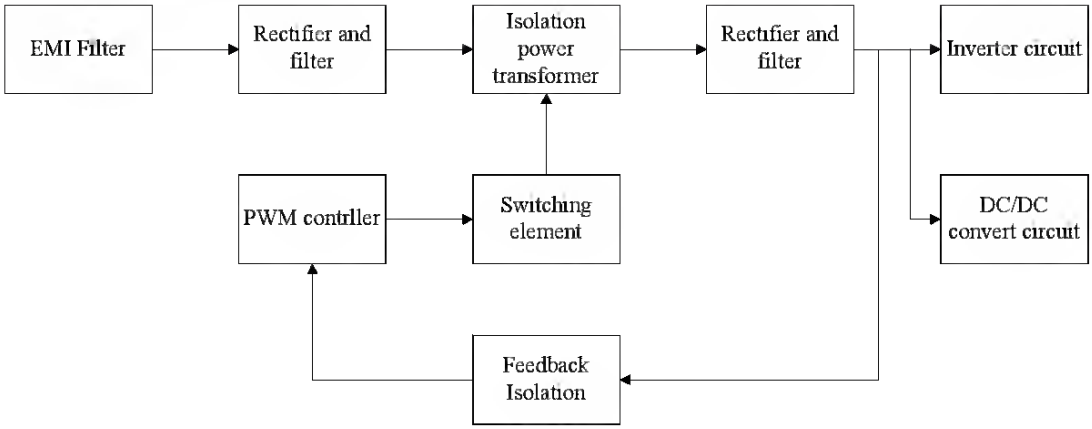

Fig.1

#1 EMI Filter

This circuit (Fig.2) is designed to inhibit electrical and magnetic interference for meeting FCC, VDE, VCCI standard requirements.

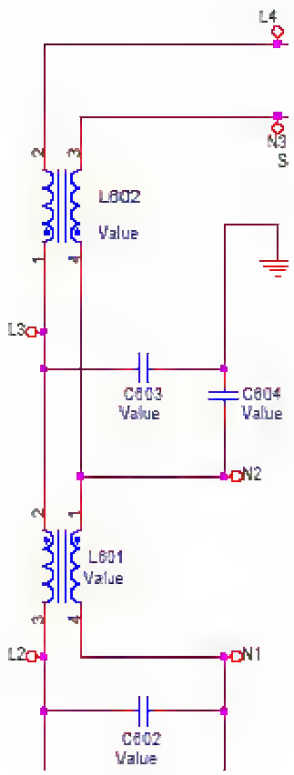

Fig.2

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6.3 Spare Parts List

Ship To Area	Qisda Part Number	Description
EMEA	9J.0LN16.11A	24W LCD MNT 1A2H EU

LEVEL	CATEGORY	OEM PART NO.	DESCRIPTION
1	LCD	5F.LUDV0.011	LCDM24W M240HW01-V0 AUO Z
1	BOARD	5E.0LN02.002	PCBA SPS BD 1A2H AU MI P244W
1	BOARD	5E.0LN01.002	PCBA IF BD 1A2H AU MI P244W
1	BOARD	6K.0LN15.001	ASSY LED PCB P244W
1	BOARD	6K.0LN12.001	ASSY CTRL BD+MYLAR+LIGHT P244W
1	CABLE	2G.00921.001	CORD H05VV-F 10A250V EUR 1.8M
1	CABLE	5K.L2H06.511	CABLE SIGNAL/C H+V OD_5.5 1.8M
1	CABLE	5K.0LN07.N01	FFC LVDS NO SILVER P244W-1A2H
1	CABLE	5K.0LN05.001	FFC WIRE 5P LED/BD P244W
1	CABLE	5K.0LN04.001	FFC WIRE 7P CTRL/BD P244W
1	CABLE	5K.0LN03.001	WIRE 11/12P 100MM P244W PWR
1	CASE/COVER/BRACKET ASSEMBLY	6K.0LN11.001	ASSY RC ABS DB27A AU-1A2H P244
1	CASE/COVER/BRACKET ASSEMBLY	6K.0LN05.001	ASSY BZL ABS+PMMA DT02A P244W
1	CASE/COVER/BRACKET ASSEMBLY	6E.0LN03.001	ASSY BASE WP ABS+P DT02A P244W
1	CASE/COVER/BRACKET ASSEMBLY	6E.0LN02.001	ASSY CLMN ABS DS14C P244W

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Appendix 1 – Screw List / Torque

(A) **STANDARD SCREW TORQUE SPEC.**

ITEM	P/N	DESCRIPTION	MOUNTING MATERIAL	TORQUE (KG-CM)	HOLE SIZE (MM)	Screw Head
1	8F.20FB4.019	SCRW MACH HEX #4-40*0.3" NI	METAL	5.0±0.6	#4-40	X
2	8F.5A224.6R0	SCRW MACH FLAT M3*6L ZN	METAL	Side mount:3±0.6 Other: 4±0.6	M3*0.5	#2
3	8F.XA356.6R0	SCRW TAP FLAT M4*6L B-ZN NYL	METAL	9.0±1.0	M4*0.7	#2
4	8F.8A356.100	SCREW MACH FPH M4*10L B-ZN NYL	METAL	11.0±1.0	M4*0.7	#2
5	8F.5A356.8R0	SCRW MACH FH M4*8L B-ZN NYL	METAL	9.0±1.0	M4*0.7	#2
6	6K.L7204.001	ASSY SCREW M4*10L FP527	METAL	11.0±1.0	M4*0.7	#2
7	6K.L8810.001	ASSY SCREW M4*8L FP726A NLK ISU	METAL	9.0±1.0	M4*0.7	#2
9	6K.L8811.001	ASSY SCREW M4*6 FP726A NLK ISU (8F.5A456.6R0+4B.L7212.001)	METAL	9.0±1.0	M4*0.7	#2
9	8F.5A422.2R4	SCRW MACH FLAT-P M2*2.4L ZN	Plastic	1.0±0.1	Φ1.4±0.05	#1
10	8F.VA512.4R0	SCRW TAP PH M2*4L NI	Plastic	1.0±0.2	Ø1.6±0.05	#1
11	8F.XA213.8R0	SCRW TAP FLAT/PT M2.5*8L ZN	Plastic	4.0±0.5	Φ2.0±0.05	#1
12	8F.WA314.8R0	SCRW TAP CAP M3*1.34P*8L B-ZN	PLASTIC	5.0±1.0	Φ2.35±0.05	#2
13	8F.XA524.6R0	SCRW TAP FLT M3*6L NI	PLASTIC	4.5±0.5	Ø2.35±0.05	#2
14	8F.XA314.8R0	SCRW TAP FLAT M3*1.34P*8L B-ZN	PLASTIC	4.5±0.5	Φ2.35±0.05	#2
15	8F.XA326.100	SCRW TAP FLAT M4*10L B-ZN	Plastic	7.5±0.5	Φ3.4±0.05	#2
16	8F.MA224.5R5	SCRW TAP FLAT-P M3*5.5L ZN	Metal	None tread：8～10 Have tread:6～8 Aluminum:4~5	Φ2.68±0.03	#2
17	8F.MA324.5R5	SCRW TAP FLAT-P M3*5.5L B-ZN	Metal	5.0±0.5	Φ2.68±0.03	#2
18	8F.00273.6R0	SCRW TAP PH F/10WSH M3*6L C-ZN	Metal	6.0～8.0	Φ2.68±0.03	#2
19	8F.VZ526.6R0	SCRW TAP FLAT+EXTM4*6L ZN-W	Metal	10±1.0	M4*0.7	#2
20	8F.00007.144	SCREW TAP CAP #4-40*10 ZN	Aluminum	3.3±0.3	Φ2.6±0.03	#2
21	8F.5A356.100	SCRW MACH FH M4*10L B-ZN NYL	Metal	11.0±1.0	M4*0.7	#2
22	8F.VZ524.6R0	SCRW TAP FLAT+EXT M3*6L C-ZN	Metal	None tread：8～10 Have tread: 6～8 Aluminum: 4~5	Ø2.68±0.03	#2
23	8F.5A456.8R0	SCRW MACH FLAT M4*8L C-ZN NYLO	METAL	9.0±1.0	M4*0.7	#2
24	8F.WA34.6R0	SCRW TAP CAP M3*6L B-ZN	PLASTIC	4.0±1.0	Φ2.35±0.05	#2

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(B) **SPECIAL SCREW TORQUE SPEC.**

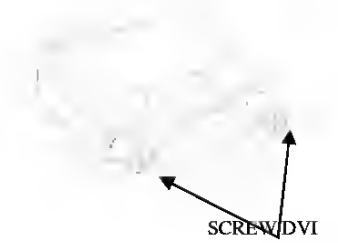
ITEM	P/N	DESCRIPTION	MOUNTING MATERIAL	TORQUE (KG-CM)	HOLE SIZE (MM)	Screw Head
1	8F.00274.8R0	SCREW FPH TAP M3*8L NI	Plastic	5.0±1.0	Φ2.35±0.05	#2
2	8F.00003.143	SCRW TAP PAN #4-40*3/8	Aluminum	3.3±0.3	Φ2.6±0.03	#2
3	8F.VG434.4R0	SCRW TAP PAN F/WSH M3*4L C-ZN	METAL	No thread：8～10 Have thread:6～8 Aluminum:4~5	Ø2.68±0.03	#2
4	8F.1A356.100	SCRW MACH PAN M4*10L B-ZN NYLO	Metal	11.0±1.0	M4*0.7	#2
5	6K.L1G06.001	ASSY SCRW M4*12L L1740	METAL	11.0±1.0	M4*0.7	#2
6	8F.5A356.120	SCRW MACH FHM4*12L B-ZN NYL	METAL	11.0±1.0	M4*0.7	#2
7	8F.PA526.8R0	SCREW TAP PAN M4*8L NI	PLASTIC	7.5±0.5	Ø3.4±0.05	#2

*SCREW Q'TYPE AND POSITION REFERRED TO C328.
*NOTES:
1. (A)STANDARD SCREW TORQUE SPEC.
2. (B)SPECIAL SCREW TORQUE SPEC.
3. T: TAPPING SCREW.
4. M: MACHING SCREW.

D-SUB Connector
SCREW TORQUE SPEC.

SCREW TORQUE: 1.2±0.3 (KG-CM)

DVI Connector
SCREW TORQUE SPEC.



SCREW TORQUE : 1.2±0.3(KG-CM)

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Appendix 2 – Physical Dimension Front View and Side view

Fig. 1 Physical Dimension Front View and Side view

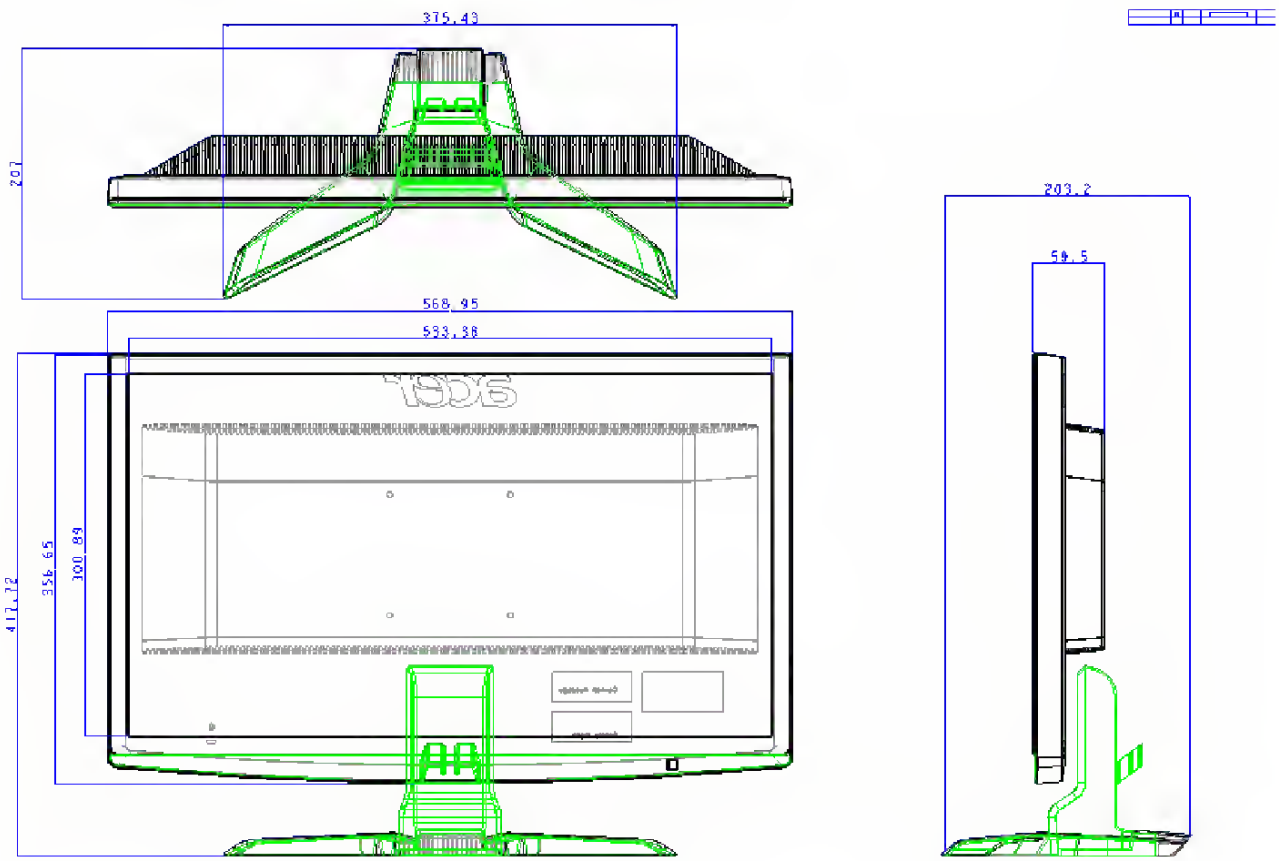

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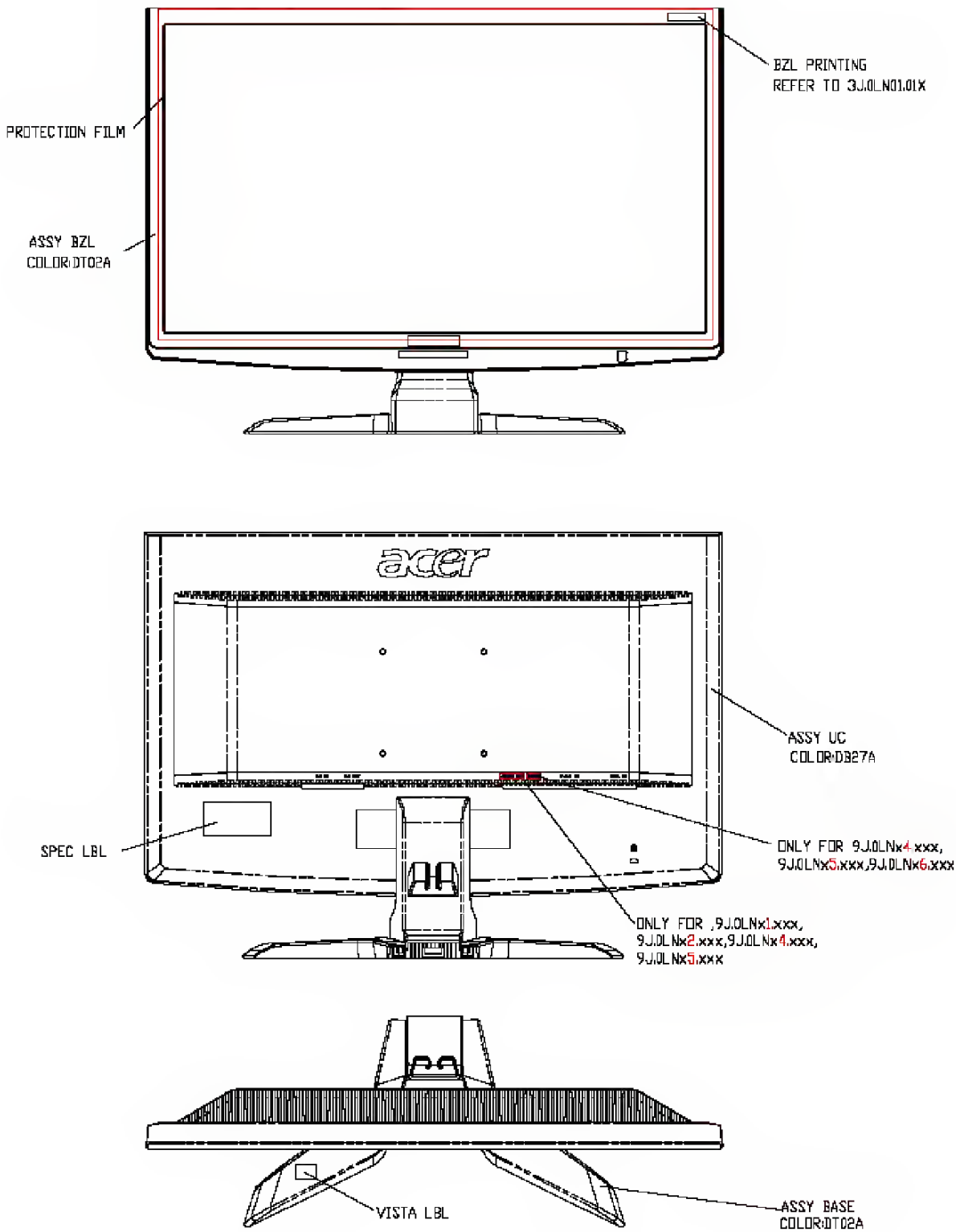
Fig. 2 Appearance Description



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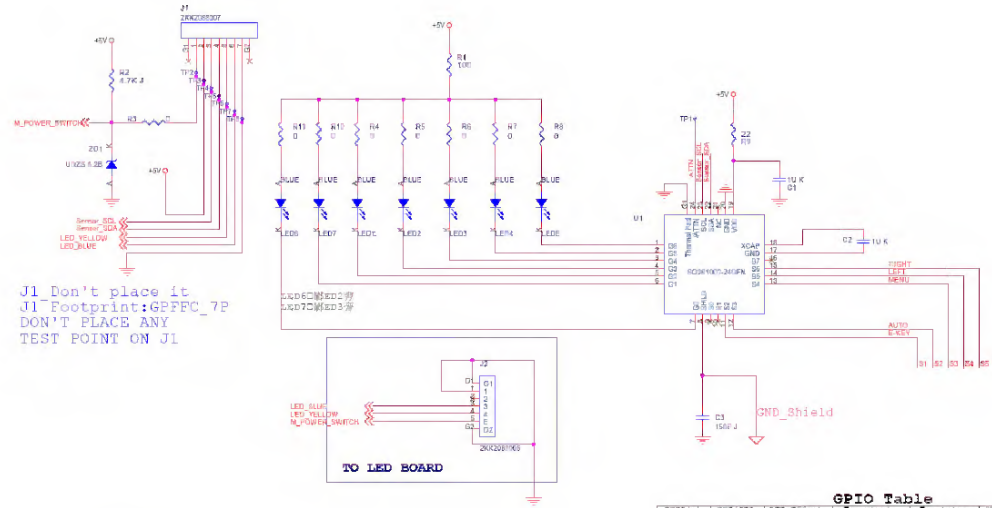
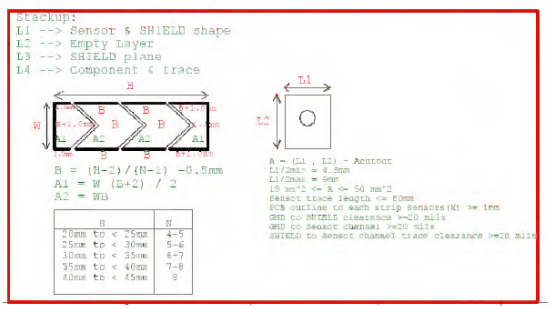
Appendix 3 –Control Board





GPIO Table

GPIO(n)	GPI/GPO	LED-Effect	Fw-output	Fw-status	FW-used	Name
GPIO0	GPO	Ramp Off	X	X	X	AUTO
GPIO1	GPO	Ramp Off	X	X	X	MENU
GPIO2	GPO	Ramp Off	X	X	X	E-KEY
GPIO3	GPO	Ramp Off	X	X	X	AUTO
GPIO4	GPO	Ramp Off	X	X	X	MENU
GPIO5	GPO	Ramp Off	X	X	X	LEFT
GPIO6	GPO	Ramp Off	X	X	X	RIGHT

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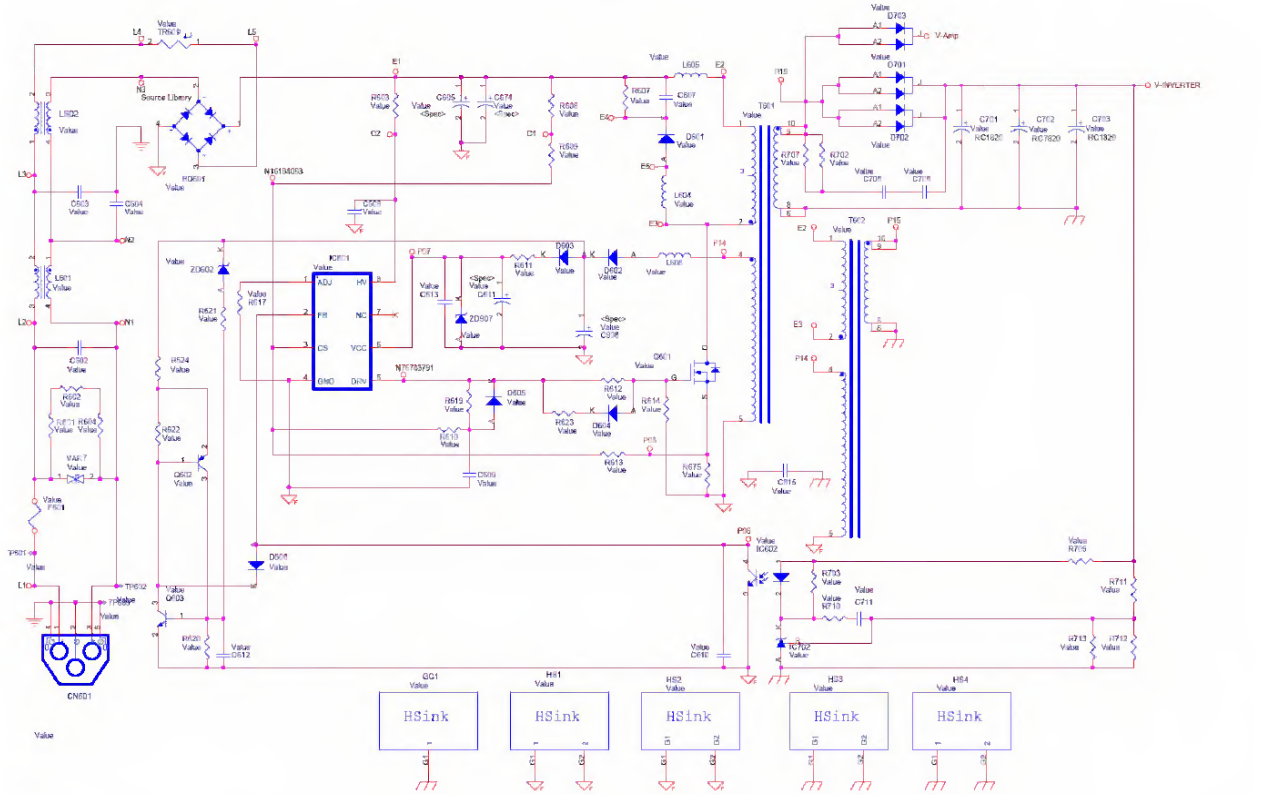
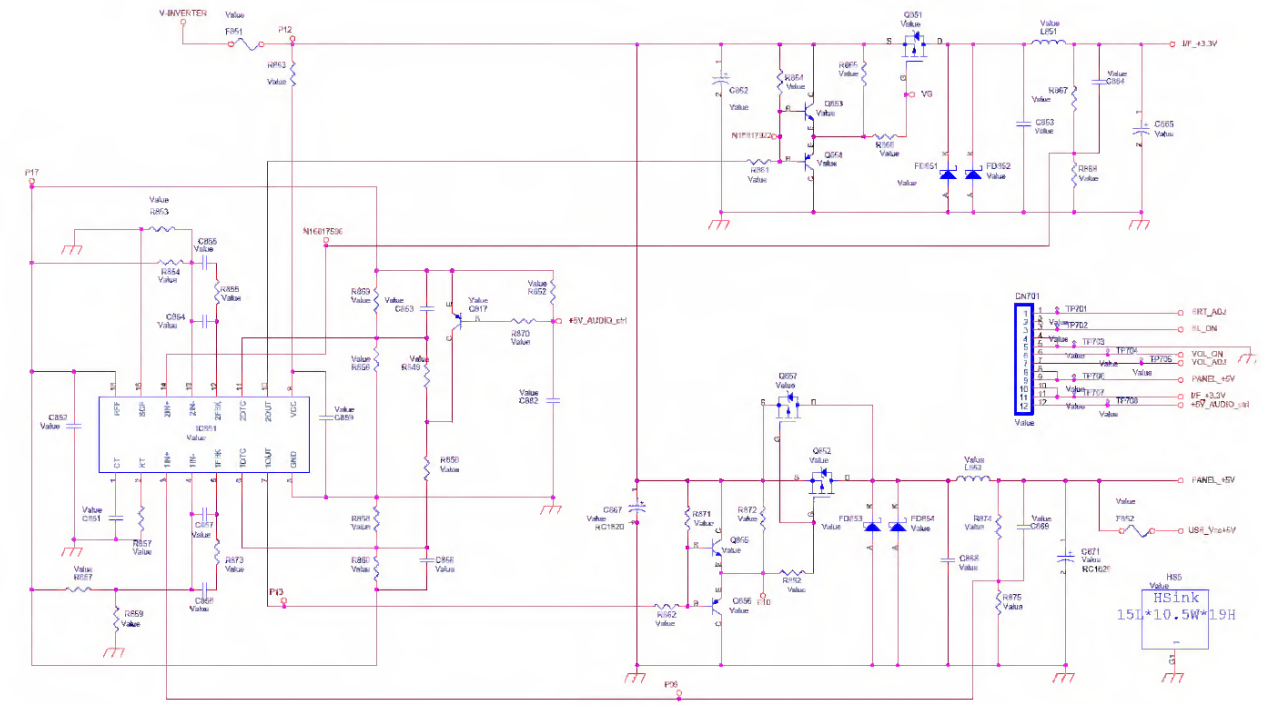
Appendix 4 –Power Board





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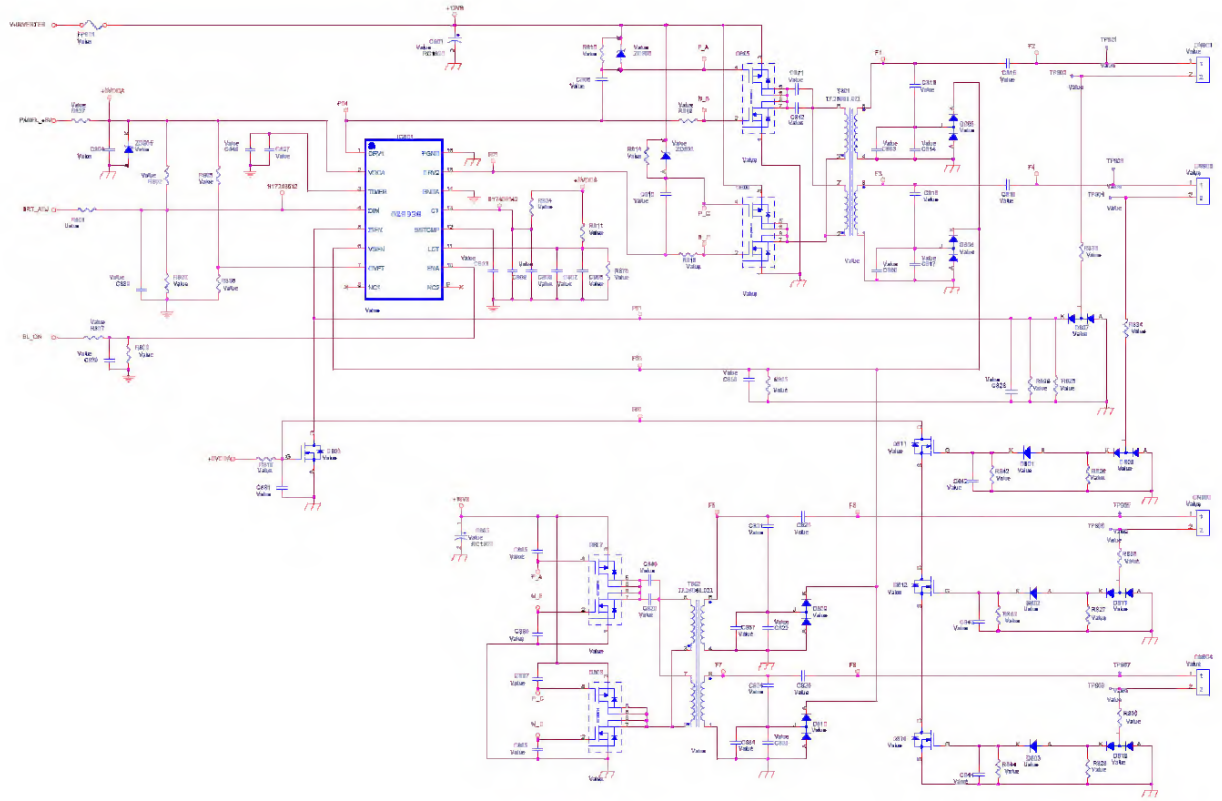

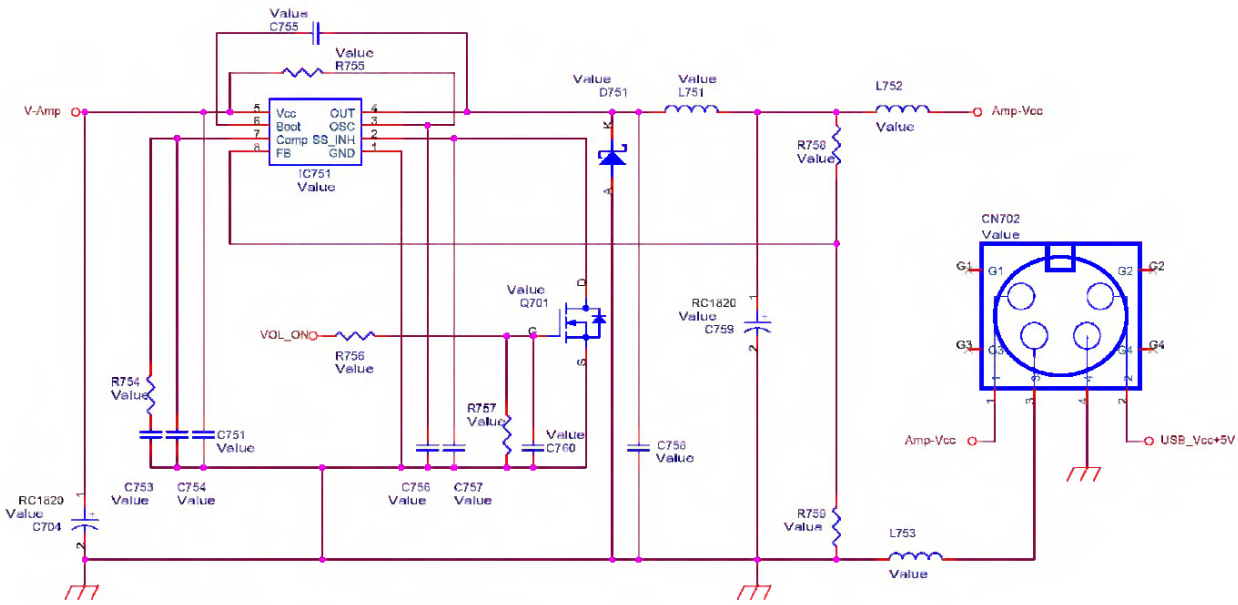

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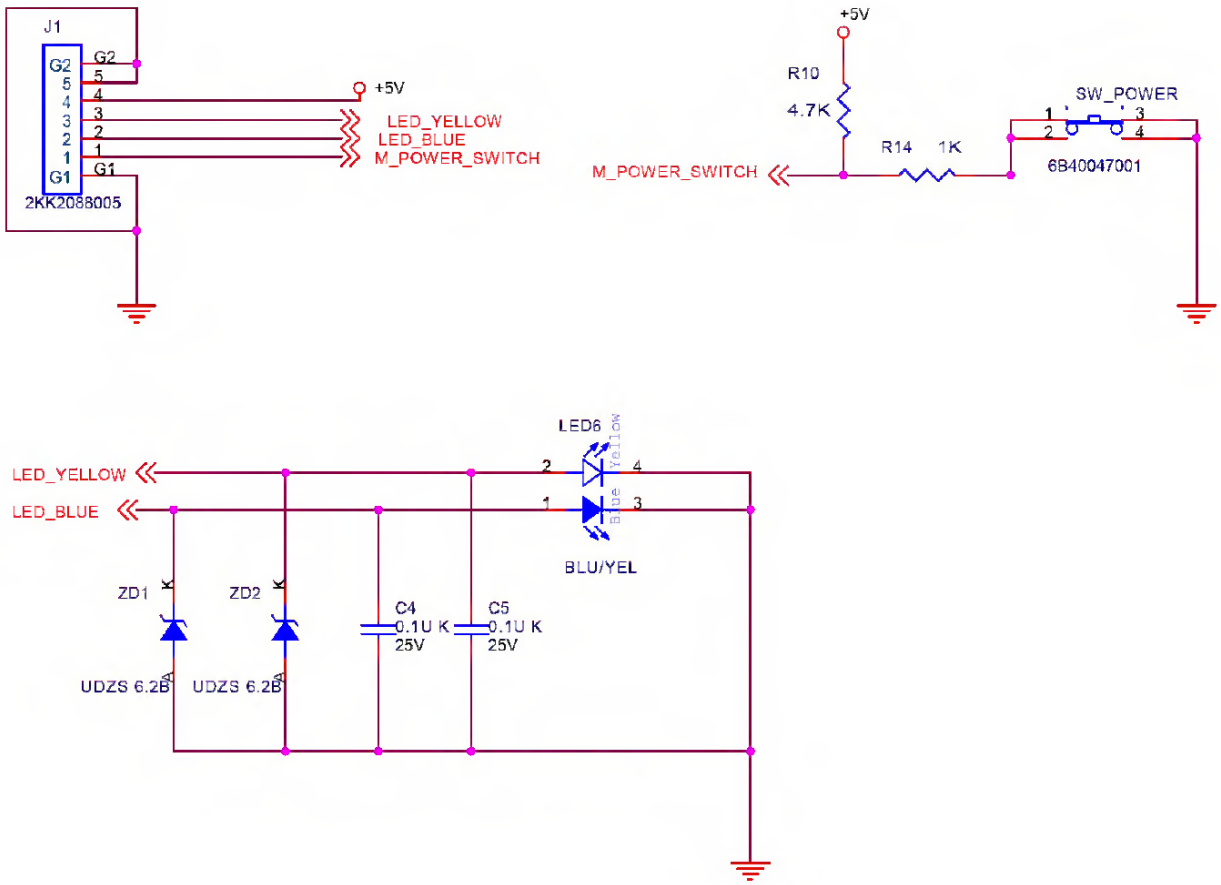
Appendix 5 –LED Board



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